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## A PROMISING OUTLOOK.

ALL CONDITIONS STILL FAVOR A MOST PROFITABLE SEASON FOR VESSELS  
OF THE GREAT LAKES.

In lake shipping circles as in all branches of the iron industry the general opinion as to business conditions for several months to come is fully as strong as it was when big contracts were made at high prices about the first of the year. Although it was generally agreed that full eighteen million tons of ore to be moved next season was covered by lake freight contracts in the busy period of several weeks ago, there is still considerable ore offered to the vessels by two or three large shipping houses. The shippers are filled up as regards Escanaba, but from the head of the lakes it is probable that 200,000 or 300,000 tons could be had at \$1.25 if the vessels were offered. Weather conditions are rather less favorable to an early opening than they were some time ago, and this has had its effect in causing the few owners who have not yet made contracts to hold off still longer. It is generally believed that the Rockefeller interest has engaged vessels to the extent of some 2,000,000 tons more than they will require, and they could undoubtedly dispose of a large part of this supposed surplus at the \$1.25 rate if they cared to. In fact it is understood that overtures were made to them on this score, but they seem satisfied to remain on the vessel side of the market. Even with this large fleet of whalebacks it cannot be learned that they have any coal, although it is offered in plenty at 50 cents to the head of the lakes. The coal shippers figure that nearly 1,500,000 tons of soft coal for 000 or 300,000 tons more to go to Lake Michigan ports. Vessel men say that these figures are higher than the actual contracts. However this may be, it is certain that there is little disposition among the vessel owners to take any more coal unless the rates are made better than those paid thus far. No coal at all for Milwaukee has been covered as yet.

Owners of lumber vessels are especially pleased with the outlook in their line. They say they could very probably close freight contracts at \$3 per thousand from the head of the lakes to Buffalo if they would signify a willingness to accept that figure. The average rate last year (lumber freights were very high in the fall but low for a couple of months in the beginning of the season) was \$3.09 per thousand. This year vessels capable of carrying full 100 millions of lumber, and which were engaged in that trade last year, will enter the ore trade. Thus the lumber carriers claim that if they are to enter into contracts the base rate should be better than \$3.

## POWER CANAL BILL.

It was expected that as a result of the hearing before the rivers and harbors committee in Washington, a few weeks ago, relative to the power canal that is being built at Sault Ste. Marie, Mich., a bill would be introduced in congress defining the position of the canal company in relation to the navigation interests of the St. Mary's river. Such a bill has been introduced by Congressman Sheldon of Michigan, but the attitude of the vessel interests toward the measure has not as yet been announced. It was undoubtedly prepared by representatives of the canal company without cooperation of any kind as yet from the vessel owners. The bill is as follows:

"Be it enacted, etc., that the consent of congress is hereby granted to the Michigan Lake Superior Power Co. of Sault Ste. Marie, Mich., its successors and assigns, to divert water from the St. Mary's river into its water power canal now being constructed at Sault Ste. Marie, Mich., said company being granted the further right to construct and maintain in and about said canal suitable works, and to do whatever is necessarily incidental to the operation of said canal for water power purposes; provided, that coincident with the diverting from the River St. Mary into such canal of any of the waters of said river, such company shall provide suitable remedial and controlling works in the rapids of the River St. Mary of a character sufficient to maintain a proper stage of water at the Lake Superior entrance of the United States ship canal at Sault Ste. Marie, and provided that this stage of water so to be maintained through the operation of said controlling works and such canal shall not at any time fall below the plane of 601 feet above mean tide water at New York, as such plane is now established by the United States corps of engineers at Sault Ste. Marie. For all stages above plane 601, as above mentioned, the level of water at said entrance shall be maintained as nearly as possible at the same elevations which would have prevailed if the canal and controlling works had not been constructed.

"Provided, further, that in the event that the said company shall neglect or fail to maintain and operate such canal and controlling works in a manner to secure the above level of water, that the secretary of war shall have authority to enter upon the premises of the said company and take possession and control of the headgates in the canal and of any controlling works of the company, and maintain and operate the same at the expense of the said company to the extent necessary for maintaining the water levels referred to in the foregoing paragraph.

"Provided further, that the diverting of water through such water power canal shall not obstruct or imperil the navigation of the St. Mary's river in that vicinity, and also that all works, operations and plans of the said company shall at all times be open and accessible for examination by the secretary of war, or a duly appointed commission of engineers, and in case any litigation arises in relation to said works, the case may be tried in the proper court of the United States in the district in which the said canal is situated.

"Provided also that the right to amend, alter or repeal this act is hereby expressly reserved."

## CHICAGO RIVER DIFFICULTIES.

Chicago newspapers are printing columns of matter relative to navigation being interfered with in the harbor on account of low water and current due to the drainage canal. Representatives of the vessel interests, the towing companies and the underwriters have made inspection trips up and down the river. They have discussed the advisability of an appeal to the war department and other measures, but have done nothing as yet.

Major Willard, the United States engineer at Chicago, in an interview says that he is of the opinion that the navigation of the river can eventually be carried on without trouble, but the channels must in the end be cleared of bridge piers, the street railway tunnels lowered and a set of rules and instructions from the war department enforced.

"There are rules for the government of vessel captains in the 'Soo' river, in the St. Clair and Detroit channels, and even on the open lakes," said Major Willard. "There is even more need for such rules now in the Chicago river. It will complain to the secretary of war or to congress of the bad effect of the new regulations."

current. The secretary will be requested to furnish information, will call upon me to report the facts. Out of such a report should come an order for a set of rules for the government of pilots and tugmen. Then there should be constant supervision here, as there is at the "Soo," to see that the pilots obey the rules. The center piers and the tunnels are the real trouble. Last year the government provided for a survey of the stream looking to a dredging to 21 feet, and committed itself to a project to dredge to that depth as soon as those obstructions are removed. If I am called upon to recommend that the dredging to the deep level be undertaken, I shall advise that it be not done until every owner of dock frontage and of buildings along the river calls in his own engineer and examines the dock and the foundations of his building. The old rows of piles will not do. New, deep piles, with strong, deep sheathing, and the whole anchored to stout piles 40 or 50 feet back must be put in to hold the buildings and preserve the stream."

## TAKING UP WORK BEGUN BY UNDERWRITERS.

"I notice," says a Cleveland vessel owner, "that the Chicago branch hydrographic office—and I suppose the other branch offices will join in the work—is about to undertake this spring in a very systematic manner the collection of all manner of reports regarding new shoals, misplaced buoys, sunken obstructions, etc. We are already in receipt of letters on this score from the Chicago office. This is a work originated two years ago by Geo. L. McCurdy of Chicago in the interest of the underwriters. Mr. McCurdy is deserving of the thanks of the vessel interests for what his office did in a private way, and is to be congratulated now that the work is to receive careful attention from government officials."

The circular from the Chicago branch hydrographic office asks the vessel owners for names and addresses of captains, in order that the information referred to may be secured from them, and in order also that the hydrographic office may be enabled to furnish the captains with publications that will give all changes that should be known for safe navigation on the lakes, such as new shoals or rocks discovered, new or changed lights and buoys, changes in soundings in rivers and harbors, obstructions, and similar information that will enable a pilot or navigator to bring his charts up to date.

### PROPOSED RECONSTRUCTION OF CRUISER BOSTON.

The naval board on construction at its session this week discussed again the question of making extensive changes on board the cruiser Boston. It was proposed to practically rebuild the ship and much opposition has been made to the plan, which would cost, it is said, what an entirely new vessel would. One of the propositions is to equip the Boston with two screws instead of one, involving many changes in internal construction and the machinery equipment. The cost would be about \$500,000. The alternative plan is to simply repair and overhaul the vessel and make such changes as are rendered necessary by the fifteen years of constant service which the Boston has seen since her first commission, and then assign her to detached duty, the fate of ships which are not quite up to date, but which have preserved a certain efficiency. When a similar plan for giving the Atlanta two screws was broached some years ago, the department decided adversely, and it appears that the same action will be taken in regard to the Boston.

## NEW RIVERBOATS AT JEFFERSONVILLE.

With the advent of spring, Capt. Ed J. Howard of Jeffersonville, Ind., owner of one of the most extensive ship yards on the western rivers, will begin the work of building a number of high-class steamboats intended to ply between such points as Memphis and New Orleans. He will also build several boats for the lower Mississippi and its tributaries. These boats are to be modern in design, equipped with the latest improvements, and will be built on lines not only for speed, but safety. As Capt. Howard has closed one of the most successful years in steamboat building, the prospects for an increased business the present year are flattering. The ship yards in Jeffersonville employ over 100 men. The steel hull industry adjacent to Capt. Howard's yard, owned by him, but superintended by Capt. Thomas Dunbar, has secured contracts for a number of steel hull boats, and work on them will begin as soon as the weather will permit.

The secretary of the German admiralty has informed the Reichstag budget committee that if the naval augmentation bill is adopted an order for steel plates to the value of 279,000,000 marks will go jointly to Stumm Bros. and Herr Krupp.



### STEEL BARGES FOR MISSISSIPPI.

CAPT. ALEX. MCDUGALL OF WHALEBACK FAME HAS INTERESTED ST. LOUIS CAPITALISTS IN A PROJECT FOR THE CONSTRUCTION AND OPERATION OF STEEL BARGES SUITED TO FREIGHT TRAFFIC BETWEEN ST. LOUIS AND NEW ORLEANS.

Capt. Alexander McDougall of Duluth, ship builder and inventor of the whaleback type of freight vessel so well known on the great lakes, has succeeded in interesting St. Louis capital in a project for the establishment of a ship yard and the construction of a fleet of light-draught steel vessels for service between St. Louis and New Orleans. Since he disposed of his interest in the American Steel Barge Co. and the ship yard at West Superior to the ship building consolidation of the lakes, Capt. McDougall has been looking for new fields of enterprise. He opened up a vessel agency at Duluth with W. A. Thompson of that city as a partner and also became interested in the enlargement of the works of the Collingwood Ship Building & Dry Dock Co. at Collingwood, Ont. Machinery from the ship yard at Everett, Wash., where one whaleback steamer was built some time ago, is being moved to Collingwood under Capt. McDougall's direction, and it is probable that he will continue to give attention to the enlargement of the works at that place, but a very large part of his time will be devoted to the new project at St. Louis, where he will be assisted by W. A. Thompson, who has been associated with him in the Duluth vessel agency. Reports from St. Louis are to the effect that the gentlemen interested in the new river company are among the most progressive in the city. St. Louis papers are, of course, enthusiastic over the project. The St. Louis Republic says:

"The long-cherished dream of St. Louis shippers of a light draught steel barge line between this city and New Orleans is about to be realized, and the last dollar needed to put the plan in practical operation has been raised, and a company formed to push the enterprise. The meeting at which a formal organization was effected was largely attended. Alexander McDougall of Duluth, Minn., the inventor of the whaleback steamers on the lakes, exhibited a number of models and explained his ideas in regard to adopting modern methods, machinery and appliances in river transportation. He demonstrated the feasibility of operating barges between St. Louis and New Orleans at all stages of the river. After carefully going over the plans it was decided that the company would erect its own plant and build both its barges and towboats in St. Louis, and a committee was appointed to select a suitable location.

"Henry S. Potter, who was instrumental in raising the money and organizing the company, was elected president, Alexander McDougall, vice president and general manager, and D. R. Francis, John Scullin, Festus J. Wade, I. H. Lionberger, Rolla Wells, Howard Elliott, James Campbell, John Fowler, Henry S. Potter and Alexander McDougall directors. The company will be named the St. Louis Steel Barge Co., and will be incorporated for \$110,000, but the capital stock will be increased as soon as the barge line is put in operation. Work on the barges and towboats will begin at once, and the company expects to have a towboat and two barges completed in time to handle the new crop of grain.

"Capt. McDougall, who has had many years' experience in steam navigation, intends to inaugurate several new features in connection with the barge line, which promises to revolutionize river navigation. Instead of using paddle wheels the towboats will be operated by large screw propellers on shafts, which can be raised or lowered to suit the varying depths of water and at the same time obtain the greatest possible propelling force. Each barge will be equipped with independent steering apparatus, so that in passing through a narrow channel they can go in single file. A number of other innovations will also be adopted, among which will be the pulling of the tow as is done on the lakes, instead of pushing it, as is now done in river navigation.

"A number of attempts have been made to organize a steel barge line, as it was admitted by grain men and shippers generally that the inauguration of a line of light-draught steel barges that would practically insure an all-water route to the gulf throughout the entire year would prove the salvation of the grain trade and jobbing interests of St. Louis, but heretofore all attempts have failed. Just before the breaking out of the war with Spain arrangements were made by Web. M. Samuel to form a company, but when the war was declared the moneyed men behind the scheme decided to wait developments, and the matter was allowed to rest. Henry S. Potter, however, started a quiet investigation on his own account, and in company with Capt. McDougall made a number of trips up and down the river between here and New Orleans, making charts of the channel and investigating the feasibility of the plan. By hard and persistent work Mr. Potter finally succeeded in overcoming all obstacles and raising the necessary amount of money to put the plan in operation. He interested the Burlington railroad officers in the idea, and they will not only furnish their share of the money to put the plan in operation, but will do much to bring the grain and other freight to St. Louis to make the barge line a financial success. The inauguration of the barge line will insure an all-water route between St. Louis and New York, as well as the leading Mexican, Central and South American and European ports, and when the Nicaraguan canal is opened will give St. Louis an all-water route to the ports of the world. This will mean an immense advantage to St. Louis merchants over their competitors in other cities, and will revolutionize freight rates to and from this city."

The house committee on naval affairs has agreed on items in the naval appropriation bill relating to improvements at the Naval Academy. For cadets' quarters the total appropriation is \$2,520,000, of which \$350,000 is appropriated this year; \$25,000 is provided for restoring the colonial building, now used as a library; \$200,000 for a sea wall; \$50,000 for foundations; \$52,000 for grading and \$2,500 for walks. Thus the total appropriation to be provided this year is \$679,500.

In connection with the department of mechanical engineering at Lehigh university, South Bethlehem, Pa., a course in marine engineering was started recently. It is hoped that the new course will soon develop into something as strong as the existing courses.

### NAVAL PROGRAM—TWELVE MORE SHIPS.

The committee on naval affairs has about completed the naval program as embodied in the appropriation bill for the coming year. At a recent meeting of the committee Secretary Long and Admiral Dewey appeared. The main topic under consideration was the increase of the navy. The secretary referred to the changed conditions of the country, owing to the increased territorial possessions, especially in the Orient, and called attention to Mr. Olney's recent article in the Atlantic Monthly, as evidence of the recognition, even on the part of conservative men, of the necessity of a large permanent increase of the naval establishment. He said that in his recommendation of three very large cruisers, three cruisers of the Olympia type and twelve gunboats he reflected the judgment of the naval board of construction and the sentiment of the navy at large. He added that he would also have included three battleships but for the fact that the three authorized last year are awaiting congressional action.

Admiral Dewey emphasized the necessity of a large naval force in the Orient, as the means of commanding the respect and encouraging the trade of the people there. He recommended the construction of three battleships in place of the twelve gunboats and gave it as his opinion that one battleship was worth twelve gunboats. Moreover he thought the fourteen gunboats recently purchased from Spain by Gen. Otis supplied whatever deficiency there may have existed in that branch of the service. The committee listened with close attention to the secretary of the navy and the admiral of the navy and practically agreed upon the following program which was straightway transmitted to congress:

Two sea-going battleships of about 14,500 tons each with 12-inch guns in turrets and the heaviest armor; three armored cruisers of about 13,500 tons each with powerful engines to give great speed and the heaviest armor and guns; three protected cruisers of about 6,000 tons each, of the Olympia type, with powerful engines to give great speed, armor over vital parts, and an armament of heavy guns with a strong rapid-fire auxiliary. Four gunboats, armored and fleet, of about 1,000 tons each.

The battleships are an addition to the recommendation of Secretary Long. The committee will recommend that Krupp armor be used in protecting these ships and that no more than \$545 a ton be paid for it.

### PRAISE FOR MAJOR SYMONS.

It has often been said that Buffalo is fortunate in having the government works in and around the city in the hands of such a capable and energetic official as Major Thomas W. Symons of the army engineer corps. There is not a more untiring worker in army or navy service, and that is certainly saying a great deal. When it was announced, some time ago, that Major Symons was to be a member of Governor Roosevelt's advisory committee in the matter of New York state improvements, a report of special importance was expected from the committee. The report, now in print, is not only highly valuable to the people of New York as regards the canal question, but it is one of the most valuable documents ever issued on the subject of lake transportation and its relation to the trunk line railways operating between Chicago and the Atlantic seaboard. It is not surprising, therefore, that Governor Roosevelt should write as follows to the secretary of war, which he did a few days ago:

"Pursuant to authority granted by your department a year ago, Major Thomas W. Symons, United States engineers, has acted as one of the canal committee of five, appointed by me, to draw up a report on the future canal policy of the state of New York. It would be impossible to overestimate the importance of this work, or the importance of the part played therein by Major Symons. The report of the committee is a public document of the highest value, and the members of the committee have been unanimous in assuring me that their work would have been altogether impossible, at least in the shape it actually took, had it not been for the invaluable service of Major Symons. Ruskin somewhere points out that where work is done for the fee, it is rare indeed to find it really well done, because all really great work, all work which makes the whole community a debtor, is done by some man to whom the work itself is the reward and the doing of it the fee. Such has emphatically been the case with this work of Major Symons. For ten months he gave his spare time to the service of the state of New York without any reward whatsoever, performing a task which probably could not have been performed at all by any other man and which, if paid for, would have cost the state many thousands of dollars. The only reward he can be given is the hearty recognition of his disinterested and public-spirited labor. I therefore write you to say with all possible earnestness and sincerity, on behalf of the people of the state of New York, that at least we most deeply appreciate his services and cordially thank both Major Symons himself and the war department, through whose courtesy Major Symons was permitted to serve on the committee."

### THE SOMERS IS UNSATISFACTORY.

Secretary Long has received a report from the board of inspection and survey stating that in many respects the torpedo boat Somers is unsatisfactory. The Somers was able to make only 17½ knots and the trial showed that she was unfit for sea service. The board suggests that the vessel be used for harbor defense and states that she is not worth a great expenditure of money.

The Somers was purchased on March 26, 1898, of the Schichau Works, Elbing, Germany, for \$72,997. It was reported that the Spanish government was negotiating for her purchase and to prevent such a contingency the naval attaché of the United States government was authorized to purchase her at the company's terms. Overtures have been made to the state department by an American agency for the purchase of the vessel. It is understood that the agency is acting for a foreign government. The navy department will sell the boat if it can get what it paid for it.

Mr. C. W. Turner, general manager of the A. Booth Packing Co., is authority for the statement that a new vessel will likely be placed on the Duluth, Port Arthur, Isle Royale route this summer. He states that he has an option on a new steel steamer that is 175 feet in length and 28 feet beam with a licensed capacity of 600 passengers and a guaranteed speed of 17 miles an hour.



## SHIPPING BILL.

A VERY ABLE REPORT FROM THE SENATE COMMITTEE ON COMMERCE ACCOMPANIES THE MEASURE AS PRESENTED TO THE SENATE.

When the shipping bill was reported to the senate a few days ago from the committee on commerce, Senator Wm. P. Frye made a brief statement of changes that had been made in the measure. Now the report of the committee, also prepared by Senator Frye is at hand. It is a most able document. The preface of the report asserts the self evident value of a national merchant marine, explains and deplores our almost entire dependence upon foreign shipping for our ocean carrying, suggests the danger of reliance upon the merchant ships of other nations which may become involved in war, the possible complete exclusion of American exports from their regular foreign markets in such a contingency, and points out that the wholesale transfer of the tonnage of a belligerent nation to a neutral flag would unquestionably involve such shipping in difficulties, seizures and detentions. It is pointed out also that the British-Boer war has materially reduced our means of transportation and embarrassed our ocean mail service. The humiliation of our reliance upon foreign vessels bought and chartered during our war with Spain is referred to, and that broad ground is taken that under those sections of the constitution which empower congress to provide for the common defense and general welfare is found the highest authority for the promotion of our merchant marine.

The decrease in American shipping since 1869 is shown. In that year the value of imports carried in American vessels was \$289,956,772 and foreign vessels \$506,492,012. In 1899 the American vessels carried \$160,644,006 and foreign vessels \$1,806,876,073, the percentage in 1869 for American vessels being 33.1 and in 1899 only 8.9. The prime reasons given for the decline of American shipping in the foreign trade are: Greater cost of building ships in the United States than elsewhere; greater cost of operating American as compared with foreign ships; causes based on foreign legislative encouragement.

The suggestion that this situation may be overcome by the free admission of foreign ships to American register is met by pointing out that if such admission were unconditional it would result in destroying existing American ship yards on the Atlantic and Pacific coasts. As vessels can be built cheaper abroad than in the United States, owing to lower wages there, as unquestionably demonstrated by the testimony taken by the committee, the free admission of foreign ships would prevent any ships for the foreign trade from being constructed in the ship yards of the United States, unless wages were reduced to the foreign level. Hence the free admission of foreign ships means the destruction of the American ship building or else a wholesale reduction of wages in American ship yards and in all the allied industries connected with ship building.

The report states that all competent authorities agree that if this bill is enacted into law it will involve a large increase in the American merchant marine. The passage of the bill, it is claimed, would probably effect a reduction of \$25,000,000 a year in ocean rates for American commerce, through the additional shipping and competition that would be created. "Foreign opposition," to quote the language of the report, "is being concentrated upon the bill, because foreign shipping interests clearly see that they will be seriously injured by the replacing of American for the foreign vessels now in the foreign trade."

The maximum annual expenditures are fixed at \$9,000,000 in the bill. About \$1,500,000 is now being paid to American ships under normal conditions for carrying the mails, a sum which should be deducted from the additional expense of the operation of this bill. About 400,000 additional tons of new shipping, costing approximately \$40,000,000 and occupying several years in its construction, would have to be built in the United States, if this bill is passed, before the maximum expenditure of \$9,000,000 could be reached.

The special higher compensation provided for steamships of twelve knots speed and over is also elaborately explained, it being pointed out that under the operation of this bill no monopoly of a route is possible, as is the case with special subsidies to certain favored lines, but that the same routes and the same compensation are open to all who care to put on ships or lines. There are but 361 sea-going screw steamships in the world today that come within the size and speed conditions that higher compensation is fixed for, and of these twenty-two are protected by the coasting laws of the United States, while the balance receive from their respective governments upward of \$20,000,000 annually. The extra compensation that is provided for this same class of vessels is merely sufficient in amount to equalize the advantages enjoyed by the foreign rivals of prospective high speed American vessels. It is expected that some 340,000 tons of foreign-built vessels now owned or building for American citizens will be admitted to American register under the terms of this bill, their owners being required to build equal tonnage in the United States before receiving any compensation.

"The provisions of the bill from every point of view," adds the report, "are overwhelmingly in favor of new and more vessels, more ship yards and greater facilities for ocean transportation. While deemed unnecessary, a provision has been inserted under which a vessel cannot receive full compensation unless she carries one-half of a cargo." The report argues that this completely answers the criticism to the effect that a vessel might run under the bill for the compensation given without carrying a cargo.

Wages paid in the European yards are shown to be on an average less than one-half the rates paid in the United States, but on this score the report adds that "when ship building yards have been sufficiently developed and have work enough to keep them going all the time, the cost of constructing ships in the United States will be materially reduced. The growth of ship building in the United States would give employment to a vast army of men in the ship yards and in the iron, steel and other industries connected with ship building."

As the most promising field for the future development of our markets for agricultural products is northern and temperate Asia, the committee believes that our grain fields and cotton plantations will gain in greater proportion from the enactment of the law than the seaboard ship building and ship owning states.

Computations are given showing the exact amount vessels of various rates of speed would get under the bill, as compared with the cost of operating them. A 21-knot ship, making 88,200 miles per annum would get, over and above the cost of coal and the handling of it, a net compensation under the bill of \$22,932, while a ten-knot ship, making 42,000 knots per annum, or less than half the distance of the fast ship, would receive a net compensation, over the cost and the handling of the coal, of \$15,120 per annum. The fastest steamships receive the lowest net compensation under the bill. A computation is given as to the amounts that tank vessels, such as are used by the Standard Oil company would receive in compensation if admitted to American registry under the bill. These vessels, carrying oil, can only take an outward cargo, and as they are foreign-built they would, because of carrying cargo one way, receive only 25 per cent of the compensation allowed under the bill.

## PRESIDENT McKINLEY ON THE SHIPPING BILL.

In his annual message to congress President McKinley recommended the passage of the shipping bill in the following language:

"The other great nations have not hesitated to adopt the required means to develop their shipping as a factor in national defense, and as one of the surest and speediest means of obtaining for their producers a share in the foreign market. Like vigilance and effort on our part cannot fail to improve our situation, which is regarded with humiliation at home and with surprise abroad. Even the seeming sacrifices which at the beginning may be involved will be offset later by more than equivalent gains. The expense is as nothing compared with the advantage to be achieved. The reestablishment of our ocean merchant marine involves in a large measure our continued industrial progress and the extension of our commercial triumphs. I am satisfied that the judgment of the country favors the policy of aid to our merchant marine, which will broaden our commerce and markets, and upbuild our sea-carrying capacity for the products of agriculture and manufacture, which, with the increase of our navy, means more work and wages to our countrymen, as well as a safeguard to American interests in every part of the world."

## REMARKABLE VOYAGE OF A SAILING VESSEL.

A most remarkable voyage was completed by the sailing vessel A. G. Ropes, which left New York in July, 1899, and has just put into the Harrison street wharf, in San Francisco, for repairs. The distance covered during the voyage was 25,000 miles and of this about two-thirds was made under jury steering gear. Off the Azores the Ropes was caught in a southwester which blew a number of sails out of the boltropes and made the men jump around lively to get the ship under snug canvas. Off the Horn the rudder head was twisted in a terrific gale and when the monkey tiller was put into use it also broke down. It was almost impossible to steer the vessel, and during the five days that the crew was fighting with the elements the Ropes nearly went ashore twice. With his steering gear in bad shape Capt. Rivers decided that it would be suicidal to again attempt the rounding of Cape Horn. The vessel was accordingly squared away for the Cape of Good Hope. While running south the vessel nearly ran into a field of ice, and the half frozen crew had to work like frenzied men to get the canvas off the ship.

The placing of jury gear on the Ropes was a clever bit of work. The inspectors of Lloyds and the Bureau Veritas were forced to give her a clearance certificate. The first thing to be done in order to make the rudder of use was to put a band around the stock. A staging was rigged up, and for five days Capt. Rivers and a carpenter worked on the job. It was way below the freezing point and the waves were washing over the staging half the time. On several occasions both master and carpenter had to be hauled ashore to be thawed out. Finally a mortise was made in the rudder stock and the iron band was got on and clamped. Then the main top gallant mast was sawed in two and made into booms. These were rigged out over the port and starboard quarter and bolted to the deck. Sheaves were placed in the end of each and through these a rope ran from the drum of the wheel to the prongs on the rudder band. In this way the vessel was steered 16,000 miles.

## A NOVEL BATTLESHIP.

The armored battleship Henri Quatre, recently launched at Cherbourg, France, is a novelty in battleship construction. She is built on the whaleback principle. Her displacement is 8,948 tons. She has a high freeboard forward with a long high superstructure amidships, and a low freeboard aft at the foremast turret. She has a belt of 11¾-inch armor at and above the water line and above this a belt of 4-inch armor. The armor of the two turrets is 11¾ inches thick and the deck armor is 2 inches thick, extending downward and inward below the belt armor with the idea of affording some protection against torpedoes. She will have triple screws, engines of 11,000 horse power and an estimated speed of 17 knots. Her main armament consists of two 10.8-inch guns, each in a turret forward and aft, and seven 5.5-inch quick-firing guns.

## GROWTH OF NEWPORT NEWS.

Newport News, Va., where one of the greatest ship building plants in the world is situated, has experienced a remarkable growth. Fifteen years ago only a few fishermen's huts marked the spot. The population is now estimated at 25,000. Besides a large steel plate industry which it is expected will be established there, near the ship yard, Newport News is to have an abattoir and packing house and a large cotton mill. Eight or ten foreign steamship lines now furnish regular service between the port and Europe. A letter to the Baltimore Sun places the commerce of Newport News above that of any other southern city—not excepting Baltimore or New Orleans—and ranks her as a formidable rival of New York and Philadelphia.

A creditable showing is made by the financial circular just issued by Chandler Bros. & Co. of Philadelphia, dealing with the business of the Wm. Cramp & Sons Ship & Engine Building Co. It shows that at the close of the fiscal year ending April 30, 1899, there was on the books of the company business amounting to \$12,400,000, as compared with \$10,000,000 during the previous year. The gross earnings for 1898-99 are given as \$5,300,000; for 1897-98, \$3,892,872; and for 1896-97, \$4,500,000.



**A STRONG IRON MARKET.**

James Bowron, first vice-president and treasurer of the Tennessee Coal, Iron & Railroad Co., says of the outlook in the iron industry:

"I have not believed, and still do not believe, that there is any prospect for a material change in the iron market, either upward or downward. The Tennessee company, taking into account the requirements of the steel works at Ensley, in addition to the orders already on its books, has 488,000 tons of its product for the remainder of this year already taken up. On the basis of the present output, we will have for the remainder of the year from this date about 700,000 tons to dispose of. Deducting the engagements already specified, will leave us with 212,000 tons to put on the market. I can see no solid reason for anticipating any change in the tone of the market in a downward direction. Prices are extremely strong abroad, notwithstanding speculative fluctuations in the warrant yard, which runs up and down the gamut while makers' prices remain practically steady. The fact is that iron is scarce and is going to become more so in the foreign markets.

"I well remember the boom in the iron trade which followed the Franco-German war in 1870. The same thing, I predict will follow the Anglo-Boer war in the Transvaal. Scores of bridges will have to be rebuilt, rails relaid, water mains and pumps and winding engines reconstructed, or additional ones laid; machinery of every sort will have to be replaced, and, in fact, the whole of an active mining country will have to be substantially re-equipped. The sacrifice of \$1 per ton would today enable Alabama iron to be sold against English iron in almost any European market, and this would restore a trade of 200,000 tons per year, which, for one entire year, Alabama has dispensed with.

"Then take the fuel situation. Within the past week our company has had an application for 100,000 tons of bituminous coal from New England and 50,000 tons of coke for the Pacific. We are receiving requests for fuel from northern states, Mexico, Spain, Italy, Australia and South America. At the present time we have none to spare, and are even refusing carload orders."

**CHECK SIGNAL WAS OMITTED.**

Editor Marine Review:—Replying to your question regarding the absence of the check signal from the code of signals to be used between pilot and engineer, as printed in department circular No. 14, dated Feb. 8, 1900, and as adopted at the last annual meeting of the supervising inspectors of steam vessels, will say that it was simply an omission by mistake, as the code of signals would indeed be very incomplete without a signal for checking the engine. All local inspectors in the ninth district have been authorized to supply the deficiency with pen and ink before distributing among the officers of vessels the circulars containing this amendment, and I presume that before this time all local inspectors on the great lakes have received similar instructions. JAMES STONE, Cleveland, March 7, 1900. Supv. Inspector, Ninth Dist.

The new code of signals between pilot and engineer with the check signal included is as follows:

- 1 whistle or 1 bell.....Go Ahead.
- 1 whistle or 1 bell.....Stop.
- 2 whistles or 2 bells.....Back.
- 4 whistles or 4 bells.....Strong.
- 4 whistles or 4 bells.....All right.
- 3 whistles or 3 bells.....Check.

Two whistles or two bells shall always mean back, irrespective of other signals previously given.

**CHESAPEAKE & OHIO RAILWAY.**

In transportation circles the Chesapeake & Ohio Railway is best known on account of the immense export business that it has built up at Newport News mainly by the employment of its own ships in the foreign trade. Among the traveling public also this road is spoken of more and more every day. While the C. & O. system proper runs from Cincinnati to New York, via Washington, connections are made from St. Louis and Chicago through the Big Four, and from Cleveland and Columbus through the Pennsylvania, the Big Four and the Norfolk & Western. Mr. C. B. Ryan, the assistant general passenger agent at Cincinnati, has been indefatigable in promoting the interests of the company throughout Ohio. The Chesapeake & Ohio is a delightful route to take to Washington as it passes through a country of unexampled beauty—Kanawha valley and Blue Ridge mountains. It is the most direct route to take to Old Point Comfort and to the Hot Springs of Virginia. Its most famous train is the F. F. V. (fast flying Virginian), which in speed and luxurious appointment is unexcelled. The White City special is the favorite train to Washington, and stop-over privileges are allowed in that beautiful city.

**IMPORTANT CHANGES IN THE NAVY.**

The assignment of Admiral Remy to succeed Admiral Watson in command of the Asiatic station will cause several important changes in the navy. Admiral Remy will be succeeded in command of the Portsmouth navy yard by Admiral Cromwell, now on board duty in Washington. It is the intention to send Capt. McCormick, at present at the Washington navy yard, to be second in command of the Asiatic station. It has been planned that while Admiral Remy shall remain on the flagship Brooklyn at Manila, Capt. McCormick will take command of a division of the fleet to be assigned to duty on the Chinese coast. Probably he will fly his flag from the Newark, as the Baltimore, on which Admiral Watson comes home by way of the Suez canal, will not be available. The Baltimore upon reaching this country will be rebuilt on the plans of the Philadelphia. Secretary Long expects that Admiral Remy will sail from San Francisco about the last of March and that Admiral Watson will be able to sail on the Baltimore for home about the fifth of April. Inquiries as to his physical condition disclose the fact that he has been ailing for several months past, but he was unwilling to apply for relief.

The Monroe Iron Mining Co. of Cleveland has been incorporated at Charleston, W. Va., by Frank Rockefeller of Cleveland.

**THE ARMOR PLATE CONTROVERSY.**

The armor plate difficulty continues. The government has advertised for 24,000 tons of armor plate without response from the manufacturers. For the three battleships of the Maine class 2,730 tons are wanted. The price is limited to \$400 per ton. For the three battleships and the three armored cruisers authorized by the last congress the price is limited to \$300 per ton. Referring to the deadlock between the makers and the government, Mr. Joseph Wharton, a director of the Bethlehem Steel Co., is reported to have said:

"The government has not acted fairly in the matter toward American makers of steel armor plate, and by its attempt to dictate a price at \$300 a ton has simply made it impossible for the two competing parties to contracts to accept anything. By invitation of the government of the United States we took up the Harveyized armor process, which cost \$500,000 for the patents alone, with a royalty of \$50 a ton in addition. The Krupp process followed as having greater resisting force than the Harveyized steel, and the price was advanced to \$545 a ton, an increase of \$145 over what was paid for the Harvey plate.

"To take up the Harvey patents, a steel hammer was built at our works," continued Mr. Wharton, "at a cost of \$1,000,000, and the whole became worthless and useless when the government changed." It was added by Mr. Wharton, in this connection, that \$500,000 had been paid for the famous La Creusot process, and that this was among the losses. The expenditure was for "guidance and information."

On the subject of foreign orders, Mr. Wharton said: "We will take orders from other governments and as many as we can get. That is practically what the situation has come to. Our works have furnished some heavy contracts abroad and can meet any requirement. But let this be understood: No European concern has any interest nor any hold on the Bethlehem company, whatever."

The committee on naval affairs is unanimously in favor of placing the best armor obtainable on the battleships but several of the members are still of the opinion that the sum of \$545 per ton is excessive. At present there is a practical deadlock on the subject in the committee.

**A VICTORY FOR THE CRAMPS.**

The board of classification of the United States general appraisers announced a decision this week to the effect that teak timber for use in warships must come in duty free. The timber was assessed for duty by the collector under paragraph 194 of the act of 1897. Some of the timber was used in the Russian cruiser Variag and some in the United States battleship Maine at the works of the Cramps. Free entry was claimed for that which went into the Russian ship under section 12, which provides that "all material of foreign production which may be necessary for the construction of vessels built in the United States for foreign account or ownership shall be admitted free." Free entry was also claimed under paragraph 699, which provides for ship timber and ship planking. The merchandise in question, the board held, is undoubtedly ship timber and ship planking and is entitled to free entry. The decision of the collector is reversed.

**LEAGUE ISLAND NAVY YARD IMPROVEMENTS.**

A Washington dispatch announces that the house naval committee has reduced the estimates for League island navy yard by \$1,000,000 so far. The following items are allowed: \$17,000 for a pair of shearlegs; \$38,000 for timber coping for the new dry dock; \$20,000 for an electric lighting plant; \$102,000 for a fireproof electrical workshop. The item of \$300,000 for marine barracks has been stricken out. The estimate of \$50,000 for extending the plate bending shop has also been sacrificed. The sum of \$36,000 for an ordnance shop is also disallowed. The item of \$30,000 for grading and paving is pruned to \$15,000; the item of \$118,000 for a foundry is reduced to \$70,000. The spar shop estimate has been reduced from \$113,000 to \$60,000. The entire sum allowed for League island will not exceed \$700,000.

**IN GENERAL.**

Capt. George Cook Reiter has been appointed to command the battleship Wisconsin when she goes into commission.

During the month of February orders for 10,543 cars and for 185 locomotives have been noted in our news columns, against orders for 5,524 cars and 165 locomotives noted in January.—Railroad Gazette.

The Greater American Line Steamship Co., incorporated recently in New Jersey with a capital stock of \$1,000,000, will establish a regular service between Seattle on the Pacific coast and Skaguay and another service between Seattle and Cape Nome.

The inquiry into the sale of the revenue cutter Corbin will be carried to Washington. The Tacoma Fish Co., which bid \$16,000 for the vessel, contends that it did not have a chance to make its bid good. It claims that the sale of vessel to E. Coffin for \$16,600 was not legally made.

An appropriation of \$100,000 was made by congress March 3 last for the "construction of a large, powerful sea-going tender for the thirteenth light-house district." Bids were solicited for the construction of the Heather under this appropriation but none of the bids received is within this sum. Capt. Thos. Perry of the light-house board has petitioned congress for an additional \$30,000, wherewith to complete this vessel. Since the bids were solicited it has been found necessary to furnish her with an electric lighting plant, a steam or other motor launch, a towing machine and several other details. It is quite likely that the board will readvertise.

Representative D. S. Alexander of Buffalo has introduced a bill in the house empowering the secretary of the treasury to limit the length of hawsers between vessels towing and being towed in train, and to limit the width of tows of vessels abreast, within any of the inland waters of the United States under the provisions of the United States statutes approved Feb. 19, 1895. Any vessel towing or being towed that violates the regulations of the bill is to be liable to a fine of not less than \$50 nor more than \$250, one-half to go to the informer. Arrest and seizure is to be made in the same manner and by the same procedure as apply for seizure and arrest for violations of the revenue laws of the United States.



## MASTERS AND ENGINEERS.

APPOINTMENTS OF OFFICERS FOR SHIPS OF THE GREAT LAKES,  
SEASON OF 1900.

Bradley, M. A., Cleveland: Steamers—Alva, Capt. M. Mulholland, Engineer A. R. Crook; George Stone, Capt. Chas. H. Francke, Engineer T. J. O'Connor; Hesper, Capt. Jos. A. Holmes, Engineer W. Miller; Pasadena, Capt. J. H. Wysoon, Engineer C. Castle; Gladstone, Capt. Paul Howell, Engineer Harry Eardley; M. B. Grover, Capt. W. E. Morris, Engineer J. F. Mahaney; City of Cleveland, Capt. C. G. Ennes, Engineer J. H. Coveyon; R. P. Ranney, Capt. C. R. Baker, Engineer G. W. Cross; J. S. Fay, Capt. D. Buie, Engineer W. Osgood; S. E. Sheldon, Capt. H. F. Holmes, Engineer Jos. Griffen; Fred Kelley, Capt. Chauncey Ney, Engineer C. H. Diem. Schooners—Adriatic, Capt. E. Saveland; John Martin, Capt. James Lawless; D. P. Rhodes, Capt. A. E. Bullock; Thomas Quayle, Capt. Fred Green; A. Cobb, Capt. N. Gifford; Sandusky, Capt. —; Neguanee, Capt. O. C. Olson.

Wilson Transit Co., Thos. Wilson, Gen. Mgr., Cleveland: Steamers—Henry W. Oliver, Capt. W. W. Dawley, Engineer Frank S. Stoehrer; Andrew Carnegie, Capt. C. C. Towsley, Engineer Wm. F. Derrig; W. D. Rees, Capt. Chas. A. Benham, Engineer John Kirby; Yuma, Capt. Daniel Buie, Engineer John Hinkelmann; Spokane, Capt. Wm. A. Williams, Engineer Wm. Kline; Olympia, Capt. A. M. Shepard, Engineer James Norton; Yakima, Capt. E. R. Morton, Engineer James McGuirk; Sitka, Capt. Alex. Forbes, Engineer Peter Jameson; Wallula, Capt. Geo. W. Bryce, Engineer Jacob Zeh; C. Tower, Jr., Capt. Geo. B. Brock, Engineer Peter Lamarr. Schooners—David Z. Norton, Capt. James Higgins; Yukon, Capt. Louis Bangs.

Dulac, Wm., Mt. Clemens, Mich.: Steamers—F. R. Buell, Capt. D. McKinzie, Engineer John Deihl; Canisteo, Capt. C. W. Woodgrift, Engineer C. E. Sylvester; A. Weston, Capt. B. F. Ogden, Engineer Ed. Cottrill; C. A. Street, Capt. W. J. Lynn, Engineer, Frank Thomas. Schooners—J. Godfrey, Capt. John B. Lozen; J. B. Lozen, Capt. —; A. Stewart, Capt. Noah Furton; Eleanor, Capt. Frank Dubay; Jennette, Capt. Richard Moore; Elvina, Capt. Frank Laforge; Fulton, Capt. Eli Furton; W. B. Ogden, Capt. Eli Peltier; S. B. Pomeroy, Capt. W. H. Campau.

Parker, A. A. & Bro., Detroit: Steamers—A. A. Parker, Capt. John T. Hutton, Engineer M. J. Gilligan; John Oades, Capt. Timothy Lemay, Engineer Henry Merrill; John Pridgeon, Jr., Capt. D. N. Sherwood, Engineer John Mogan; B. W. Blanchard, Capt. Thos. Meikleham, Engineer John Bloome; wrecker Favorite, Capt. Martin Swain, Engineer Geo. L. Simmons; wrecker Saginaw, Capt. Isaac Watt, Engineer George Castis. Schooners—B. W. Parker, Capt. Edw. Lohr; Saveland, Capt. Henry Morey.

Minneapolis, St. Paul & Buffalo S. S. Co., J. C. Maclay, Gen. Mgr., Buffalo, N. Y.: Steamers—Minneapolis, Capt. Wm. Jamieson, Engineer Bion St. Bernard; St. Paul, Capt. Peter Thompson, Engineer John Davidson; Hennepin, Capt. A. E. McGregor, Engineer Wm. Bridges; Nebraska, Capt. Neil Anderson, Engineer Joseph Taylor; John Pridgeon, Jr., Capt. D. N. Sherwood, Engineer John Mogan.

Comstock, A. W., Alpena, Mich.: Steamer—Simón Langell, Capt. John A. Stewart, Engineer Robert Cameron. Schooners—Arenac, Capt. Nate C. Kendall; W. K. Moore, Capt. Bert Warwick; Interlaken, Capt. Charles Adams; Abram Smith, Capt. H. D. Ray; Theo. Voges, Capt. —.

Runnels & Sinclair, Port Huron, Mich.: Steamers—Maggie Duncan, Capt. D. M. Sinclair, Engineer Irving Buzzard; O. O. Carpenter, Capt. J. E. Rathbun, Engineer J. C. Watson. Schooners—Favorite, Capt. L. Sinclair; Constitution, Capt. E. R. Tousley; E. E. Tyson, Capt. C. W. Annis.

White Star Line, office of A. A. Parker & Bro., Detroit, Mich.: Steamers—Tashmoo, Capt. B. S. Baker, Engineer Winifred Dubois; City of Toledo, Capt. John J. Stover, Engineer John Westwick; Greyhound, Capt. A. Fitts, Engineer —.

Warren, Wm., Tonawanda, N. Y.: Steamer—P. H. Birkhead, Capt. W. J. Hayes, Engineer Edward Knibbs. Schooners—C. B. Jones, Capt. John Nelson; C. H. Burton, Capt. Thos. McDermott; Commodore, Capt. Chas. Pederson.

Volunteer Transit Co., Thos. Wilson, Mgr., Cleveland: Steamers—Volunteer, Capt. Joseph S. Wood, Engineer Charles Stoeber; Ravenscraig, Capt. Wm. Benham, Engineer John Courtney.

Hawgood & Avery Transit Co., H. A. Hawgood, Mgr., Cleveland: Steamers—S. S. Curry, Capt. Geo. Robarge, Engineer Geo. Wilson; Geo. F. Williams, Capt. T. C. Ellis, Engineer Robert Buchanan.

Keith, J. G. & Co., Chicago: Steamers—Parks Foster, Capt. John Cochran, Engineer A. C. Bowen; Ira H. Owen, Capt. D. J. Duncanson, Engineer Wm. Beckbissinger.

Becker, W. H., Cleveland: Steamers—Geo. W. Roby, Capt. R. Pringle, Engineer W. H. Kennedy; W. F. Sauber, Capt. H. A. Stewart, Engineer C. J. Church.

Millen, J. W., Detroit: Steamer—Iron King, Capt. Wm. F. Millen, Engineer Charles Howard. Schooner—Iron Queen, Capt. Gus. E. Atkinson.

Hawgood Transit Co., Arthur Hawgood, Mgr., Cleveland: Steamer—Tampico, Capt. K. A. Jensen, Engineer Wm. Stone.

Representative Cummings of New York has introduced a bill to purchase twenty submarine boats from the Holland Submarine company. His bill is based upon the recent showing made by the submarine boat Holland. It is claimed that the Holland company will set itself right with the government by having the Plunger, now at Baltimore, removed to the works of the Wm. R. Trigg Co. at Richmond, Va., and there equipped with machinery similar to that which has proven so successful in the Holland.

## LAKE SUPERIOR ORE SUPPLY.

NOT LIKELY TO BE EXHAUSTED IN THE NEAR FUTURE—GREAT TRACTS OF UN-  
EXPLORED LANDS—OPINIONS OF J. M. LONGYEAR.

Considerable interest is attached to the opinion of Mr. John M. Longyear of Marquette, relative to the future of the Lake Superior ore region. The Iron Trade Review directs attention to the fact that Mr. Longyear's holdings of timber and mineral lands in Michigan are probably more extensive than those of any single capitalist, and his years of exploration and pioneering on the Gogebic, Menominee and Marquette ranges have given him unusual familiarity with the resources of the Lake Superior region. His advocacy of the erection of iron and steel plants on Lake Superior has been an outgrowth of the relation he has sustained to mineral developments there and his desire that the largest possibilities of these natural advantages may be realized. Mr. Longyear says:

"I have no idea that the iron ore deposits of the upper peninsula of Michigan are likely to be exhausted in the near future. The deposits now being operated will probably be exhausted in a few years but there are extensive tracts of unexplored territory which will undoubtedly yield large quantities of ore. Explorers are now at work on some of these tracts and during the coming year will probably reveal new deposits. It is doubtful, however, if the explorers will find new deposits of first-class ores rapidly enough to take the place of such deposits which are becoming exhausted, but it is safe to say that before the first-class ores of the upper peninsula become exhausted, the iron and steel makers will have turned their attention to the lower grade ores, of which there are unlimited quantities in this region. Mining operations will undoubtedly be carried on for the production of iron ore in the upper peninsula of Michigan for at least several generations to come.

"At present, indications strongly point to the possible early erection of steel manufacturing plants near the mines. Recent improvements in the saving of the by-products created in the process of reducing wood to charcoal make charcoal the cheapest fuel of any now in use. Immense regions near the mines are covered with a heavy growth of hardwood timber, making this a desirable point for manufacturing the ores near the point of production. This will also make it entirely practicable to use ores which would not bear the cost of transportation to distant furnaces. These ores can be had at prices that are very much less in proportion to the iron contents than the prices for the so-called first-class ores.

"With immense bodies of ore richer than those mined in Alabama, Pennsylvania, etc., lying near a cheap fuel supply, there is no likelihood of any early cessation of iron ore mining in this region. It is, however, very likely that many changes in the manner of manipulation of the iron ore and the production of iron and steel will take place in the near future. There are none of these changes, however, that seem to indicate any decrease of industrial activity in the upper peninsula. In fact, the indications all seem to point the other way. There are many other industries now gaining footholds in the upper peninsula of Michigan. Woodworking establishments are increasing and will ultimately employ more men than have been employed in the cutting of the pine timber, the end of which business is plainly in sight. All the immense timber resources of the region will be drawn upon extensively in the near future and while there are large areas of good soil which yield satisfactory returns to the agriculturist, there are other extensive areas which are undoubtedly adapted to nothing so well as the production of wood, some varieties of which grow quite rapidly. In time, some system of intelligent and practical forestry will undoubtedly be inaugurated which will insure a perpetual supply of timber for industrial purposes.

"There are many other minerals known to exist in the upper peninsula, aside from iron ore and copper, but which have heretofore had little attention. These will naturally receive more attention as the population increases and as knowledge of the natural resources develops. The clays, marbles, sandstones and other building materials have in them a basis of extensive industries. There are also extensive areas underlaid by limestones, beds of marl and other cement making material, not to speak of gold, silver, graphite, roofing slates and gannister, all of which are known to exist and have already had some attention. The numerous water powers afforded by the mountain streams, with frequent cataracts and rapids, also afford a basis for industries. Some of these powers have already been improved, but there are many others awaiting development. The region is one full of natural resources of many kinds, which will undoubtedly support an ever increasing population for hundreds of years."

## INTERNATIONAL CONGRESS OF NAVIGATION AT PARIS.

The newspaper organs of the mercantile marine of France have been devoting considerable space of late to the program for the sittings of the International Congress of Navigation, which is to be held in Paris during the last week in July. All the great maritime interests of the world will be represented at this gathering. The program covers every phase of transportation by water.

A bill has been introduced in the United States senate authorizing the president of the United States to extend an invitation to the Navigation Congress at its coming session in Paris to hold its ninth congress in Washington. The bill provides that the congress be held in the congressional library building and sets aside the sum of \$25,000 for the entertainment of the delegates. To hold the ninth congress in this country would be of incalculable advantage to the nation. It would bring the foremost maritime men of the world in personal touch with the development of American shipping interests. The classes of persons entitled to membership in the congress include representatives of governments, delegates accredited by cities, chambers of commerce, navigation and towing societies, railroad and transportation organizations, technical, scientific and industrial societies and syndicates, and persons who have signified their intention of becoming members before the opening of the session.

Mr. Elmer L. Corthell, the United States delegate to the seventh congress, which was held in Brussels in 1898, has been in Washington to arrange for the representation of this government at the Paris congress. He is also urging the passage of the bill authorizing the president to invite the ninth congress to Washington. The measure should by all means be passed.



**CONSOLIDATION OF LARGE TRANSPORTATION INTERESTS.**

Bernard N. Baker, president of the Atlantic Transport Co., announces that the Atlantic Transport Co. and the Leyland line have combined their interests. By this consolidation of interests a company will be formed with a capital of \$25,000,000, controlling a fleet of forty-eight passenger and freight steamships. It is the intention to have three services a week at New York, two at London and one at Liverpool. In addition freight lines will be maintained between Baltimore, Philadelphia, Boston, Portland and Montreal, and points in England, Scotland, Ireland and the Mediterranean. While the corporation to be formed will be English, American capital upon which the Atlantic Transport line was founded will be largely interested. The Atlantic Transport line is a West Virginia corporation. The steamships of both lines are of British registry. The Leyland line is controlled by Frederick Leyland & Co. of Liverpool, one of the largest shipping concerns in the world. The Leylands have four passenger boats in course of construction for the New York service. In discussing the combination Mr. Baker said:

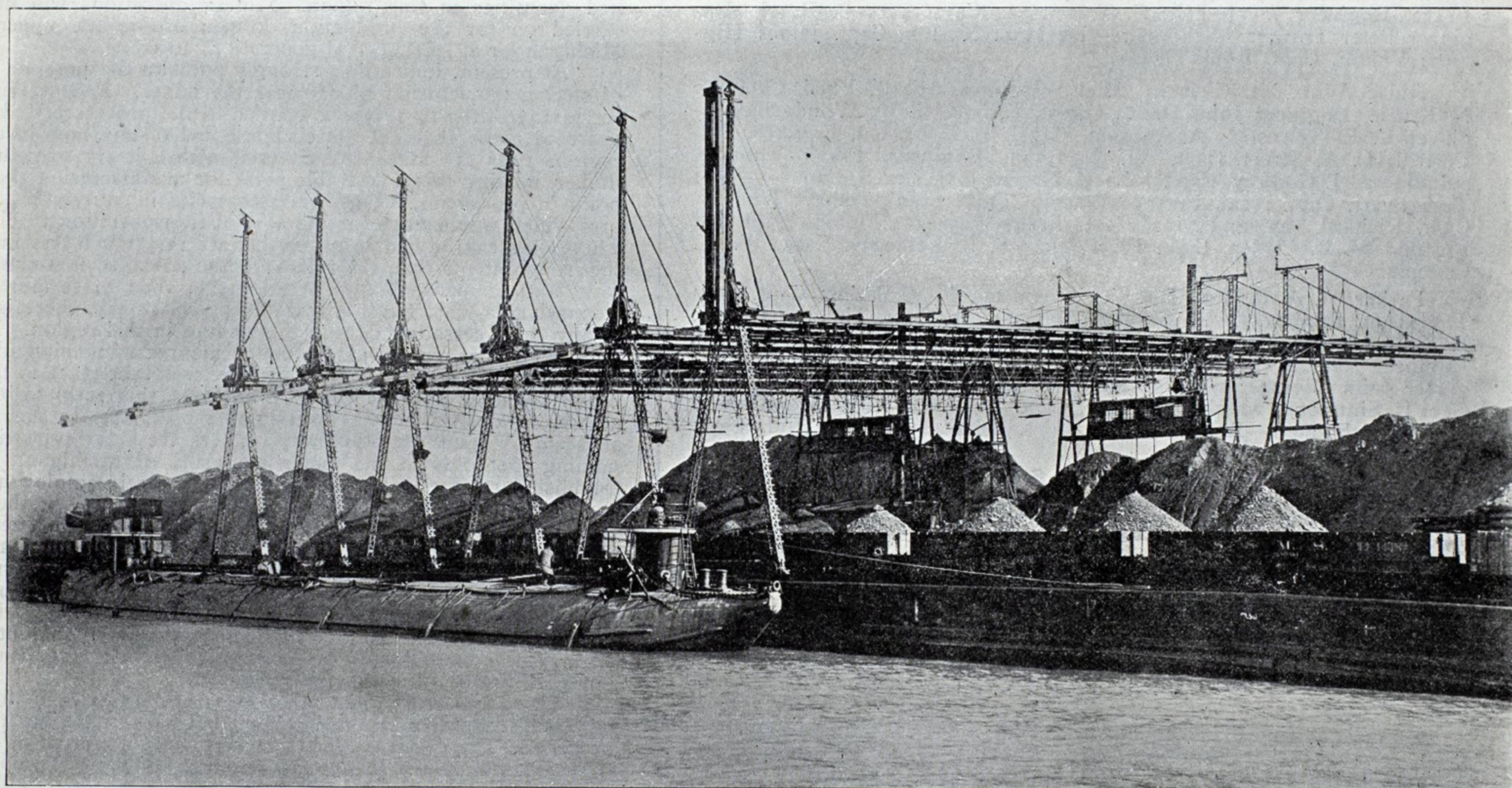
"I have purchased a large block of stock in the Leyland line, and the Leyland line has purchased the same stock in the Atlantic Transport line. The two companies will be reorganized into one corporation having a capital stock of \$25,000,000. The name of the new line has not been decided upon as yet. The amalgamation includes all the branches of both organizations—the Atlantic Transport's New York, Philadelphia and Baltimore to London service, and the Leyland's Boston, New York, Portland (Me.) and Montreal to Liverpool service. The Mediterranean and

thought the time was ripe to form a big organization, and this has been accomplished. We will give the public a first-class service, and have no doubt that it will appreciate our efforts."

**INTERNATIONAL ACTION ON WATER LEVELS.**

An international commission to deal with the question of lake levels now seems assured. Senator Platt's resolution with this end in view passed the senate on Tuesday of this week. It is well known to readers of the Review that the Niagara river dam project, as well as several ship canal and power canal schemes that have attracted public attention in the lake region of late, are of an international character and call for the appointment of such a commission as is proposed in the measure just passed.

The Platt joint resolution authorizes the president of the United States to invite the government of Great Britain to join in the formation of an international commission to examine and report upon the diversion of the waters that are the boundaries of the two countries. It provides for a commission composed of four members from each country, whose duty it shall be from time to time to report upon the conditions and uses of the waters adjacent to the boundary line between the United States and Canada, including all the waters of the lakes and rivers whose waters flow by the river St. Lawrence to the Atlantic ocean, and also upon the effect upon the shores of these waters and the structures thereon and upon the interests of navigation by reason of their diversion from their flow, and further to report upon the necessary measures to regulate



WHALEBACK BARGE UNLOADING ORE UNDER BROWN CONVEYORS AT CARNEGIE DOCKS, CONNEAUT, O.

Spanish services of the latter line are also included. This will make the new line the second largest company in the world. The Hamburg-American line, the largest company, will be only slightly in the lead. Altogether we will have in the North Atlantic trade about forty-eight vessels, including the eighteen ships now in course of construction—five by the Leyland line and thirteen by the Atlantic Transport line. Six of these will be ready for service shortly.

"All the new vessels will be passenger and freight carriers of over 10,000 tons each, and will be fast goers. After reorganization the vessels will leave the different cities just the same as at present. The Atlantic Transport line's vessels will continue to run to London, and the Leyland line's ships to Liverpool. Thus we will have a direct service to those two important ports of England. The meeting at which the officials and directors of the new line will be chosen will be held in London about April 14. We expect to have everything working smoothly under one management May 1. While the new company will be incorporated under English laws, it will be an Anglo-American company in every sense of the word. The board of directors will be composed of Americans and Englishmen. It is not the intention of the new company to stop with what we have got. Wherever the present service can be improved an improvement will be made at once, and where the service can be extended it will be done. It is our intention greatly to improve the New York and Boston services. It is too early, however, to state just what will be done. Ten of our vessels are in the service of the British admiralty, engaged in transporting troops and supplies to the army in South Africa, and when they are returned to us we will be better able to tell what we will do.

"I will be the largest stockholder in the new organization and will have complete charge of its business in the United States. I will also be a director in the company. My headquarters, of course, will be located in New York. The principal reason for the amalgamation is that the business of the Atlantic Transport line has become so great that I could not give it the attention it required. I was continually crossing the Atlantic, looking after the European end of the line. Another reason is that shippers want their goods carried by big steamship companies. We

such diversions. The president is authorized to appoint the United States' members of the commission, and the commission is authorized to employ such surveyors, experts and other persons as it may deem needful. The resolution provides for an appropriation of \$20,000 for the work.

**REVENUE CUTTER FOR THE GREAT LAKES.**

No award of contract has as yet been made by the secretary of the treasury for the construction of the revenue cutter for the great lakes for which bids were opened, a few days ago, by Capt. C. F. Shoemaker of the revenue cutter service. Townsend & Downey of New York were the lowest bidders, as shown by the following list of proposals: Chamblin & Scott, Richmond, Va., \$163,500, vessel to be finished twelve months from date of contract; Wm. R. Trigg Co., Richmond, Va., \$157,000, on or before May 28, 1901; American Ship Building Co., Cleveland, O., \$250,000, on or before May 1, 1901; Townsend & Downey Ship Building & Repair Co., New York, N. Y., \$151,000, twelve months from date of contract.

**A REVERSIBLE AIR DRILL.**

A form of reversible air drill lately invented will prove especially interesting to ship builders, railroad and bridge builders and to those engaged in repairs along these lines. It will soon be placed on the market and will be known as the Chicago drill, manufactured by the Chicago Pneumatic Tool Co. This invention is a machine operated by compressed air, and so constructed that it is reversible, making it adaptable to drilling, reaming, tapping, flue rolling, stay bolt work, etc. The operating part runs entirely in oil, thus obviating all wearing and cutting and greatly reducing cost of operation.

Capt. James Kerr, one of the oldest river steamboat men, died at his home in New Orleans recently. He had been identified with steamboat navigation since 1839 and was a perfect mine of stories of early days on the Mississippi. During late years he had lived a retired life in New Orleans.



#### QUESTION OF SHEATHING.

Admiral Dewey came unexpectedly to the support of Rear Admiral Hichborn on the subject of sheathing the new cruisers before the house naval committee a few days ago. Some time ago a majority of the naval board of construction decided to recommend to congress a repeal of the law which authorized the sheathing of ships. Incidentally the question came up in connection with the proposed change of the act which requires the latest vessels, three battleships and the three armored cruisers, to be sheathed and coppered. The change would result in cutting down the appropriation for these vessels about \$1,000,000. The naval committee has been more or less impressed with the arguments of the majority of the board of construction who are now opposed to sheathing. Rear Admiral Hichborn submitted a long reply to the opponents of sheathing, which included tables and other matter showing that his position is sustained by foreign practice and results.

The committee asked Admiral Dewey for his views on sheathing and he gave them in emphatic terms in favor of the system. He was able to furnish specific instances of the advantage of sheathing from among the ships of the Asiatic station. He said that aside from the possibilities of galvanization—which is denied in Hichborn's report—there was much to commend the idea. He noticed that sheathed ships newly docked had vastly greater speed than ships which were not sheathed and had not been docked every few months. This meant a great deal, he added, when

#### AT THE WORKS OF THE HARLAN & HOLLINGSWORTH CO.

The steamer Chesapeake, launched by the Harlan & Hollingsworth Co. at Wilmington, Del., on Saturday last, is one of the two vessels which this company is building for the New York & Baltimore Transportation Co. of Philadelphia, of which Mr. F. S. Groves is the general manager. These vessels are intended to run between New York and Baltimore on what is familiarly known as the Shriver Line. Dimensions of the Chesapeake are as follows: Length over all, 219 feet; length between perpendiculars, 205 feet; beam, molded, 32 feet; depth to upper deck at center, 23 feet 3 inches. The motive power consists of one triple expansion, three crank, surface condensing engine of the open front type, with cylinders of 18, 28 and 45 inches diameter and 30 inches stroke, supplied with steam by two Scotch boilers of 11 feet diameter and 10 feet length. The vessel is of steel throughout and has two decks with three side ports on each side. She is designed to carry about 900 net tons of cargo, and will develop a speed when fully loaded of about 12 knots. The steamer is built for freight entirely but has the best of accommodations for officers and crew. Her sister ship, the Manna-Hata, will be launched in a few weeks.

In addition to these two vessels, the Harlan & Hollingsworth Co. has under construction a 280-foot steamer for the Metropolitan Steamship Co. of New York; the Grecian for the Boston & Philadelphia Steamship Co., which will leave in about a month; three tugs for the Pennsylvania Co.,



A SHIP OF THE BRITISH FLEET.

vessels were on a foreign station in time of war. He said he was surprised that experts could be found who were opposed to sheathing.

Admiral Dewey's views were listened to with close attention and made a profound impression upon the committee. It is more than likely that the provision for sheathing will stand and that the ships authorized this year will also be sheathed. As a result of the hearing before the naval committee, Secretary Long has recommitted the entire question of sheathing to the board of construction.

#### A FLURRY OVER DRY TORTUGAS.

Just at present there is a little flurry in Washington between the navy department and the Marine Hospital service. The navy department has recently spent about \$50,000 in establishing a coaling station at Dry Tortugas and in equipping what it considers, upon the island, the most important strategic base between the Chesapeake and Central America. A few days ago Secretary Long was surprised to receive a notification from the treasury department to stop work at Dry Tortugas by April 1, as Surgeon General Wyman needed the place to care for yellow fever and bubonic plague patients. The navy department thinks that there are several other adjacent spots available for hospital purposes and will decline to surrender Dry Tortugas unless specifically ordered to do so by the president himself.

Rear Admiral Watson has been relieved from the command of the Asiatic squadron, on account of ill health. He will transfer his flag to the Baltimore, which is to be detached from the squadron, and come home by the way of the Suez canal, stopping at European ports. Rear Admiral Geo. C. Remey will be ordered to command the Asiatic squadron.

and two torpedo boat destroyers, Hopkins and Hull, for the government. The torpedo boat destroyer Stringham, which is almost completed, will be taken out for her final trial in a few days. The company has also just signed a contract for three 200-foot barges for the Rockland-Rockport Lime Co. of Boston. Repair work under way includes a thorough overhauling for the steamer Foxhall of the United Fruit Co., and a contract has also been signed for adding 45 feet to the length of the steamer Indian of the Boston & Philadelphia Steamship Co.'s fleet.

In its car department this company has orders on hand for fifty-one vestibule coaches for the New York Central company, twenty-two coaches for the Philadelphia & Reading company and three for the Pittsburgh & Lake Erie company, as well as a large number of cars for export.

Reports of a recent trial of the torpedo boat destroyer Viper, built for the British government by the Parsons Marine Steam Turbine Co., are to the effect that when the vessel was steaming at her maximum speed of 35.5 knots the motors were using steam equivalent to 11,000 indicated horse power. The motors are arranged to drive four shafts, each carrying two screw propellers, or eight in all, running at about 1,800 revolutions a minute. Notwithstanding the enormous power, it is said that there is ample space in the engine room and that when running at her highest speed the Viper was as free from vibration as a sailing ship. It is also claimed that a gunner could have trained a gun on the boat with as great ease as would have been possible on a first-class battleship.

Mileage tickets of the Central Passenger Association are good on the Nickel Plate road between Buffalo, Chicago or intermediate stations. 32 Mar. 16.



## WHAT THE NAVIES ARE DOING.

RECENT TENDENCIES OF DEVELOPMENT AND THE EFFECT THEREON OF THE WAR WITH SPAIN—A REVIEW OF THE LATEST PRACTICE AMONG THE PRINCIPAL POWERS.

By Lieutenant-Commander GEORGE H. PETERS, U. S. N., Staff Intelligence Officer.

The purpose of this paper is to show the trend of foreign naval opinion and development, as represented in the professional press and other publications, on subjects of current interest. These foreign views and tendencies are given as being worthy of consideration, but not as being necessarily applicable to our own service. In considering the principal foreign navies with a view of noting recent tendencies of development, the most striking feature which presents itself is the marked effort now making by the important maritime powers to increase their naval strength. Never before, except perhaps spasmodically during a naval war, has such endeavor been more vigorous or more general. Whether recognition of this be accorded willingly or unwillingly, it must be reckoned with. The importance of sea power is clearly perceived, and naval ship building programs grow more extensive and more elaborate.

In the apportionment of new tonnage abroad the large share set apart for battleships, notwithstanding their great cost, shows that responsible foreign opinion regards them as constituting the real fighting strength upon which reliance must be placed to win naval battles. This view was held long before the Spanish armored cruisers were destroyed at Santiago, but it now meets with general acceptance and the assertion that the building of battleships is a wasteful use of money and resources is seldom heard. In France and in Italy, for special reasons, the armored cruiser is still held in relatively high esteem, and in the French press the claim has been persistently urged that the battleship will be deprived of its value by the submarine boat; but following this comes a recent request by the minister of marine for authority to lay down additional battleships for the French navy. As battleships are intended to have the greatest possible fire energy, with the best protection attainable, their gun fire must be the maximum which their displacement will permit; and the latest foreign expert opinion is practically unanimous that their armor must not only protect the water line and the gun positions, but that the hull and the personnel must be effectively sheltered.

The typical features of the battleship, maximum offensive and defensive power, are not dependent on circumstances, but are ready at all times. Speed varies with conditions of service, and for battleships is regarded as a secondary consideration, although a very important one. The anxiety which the monitors caused Admiral Sampson has impressed anew upon foreign observers the need of strategic mobility. Other things being equal, the more efficient of two fleets of battleships will be the one whose slowest ship is faster than the slowest ship of the enemy. The aim abroad now is to have the battle fleet composed of ships having great offensive power and the best protection obtainable, with a minimum speed of not less than 15 knots. While some of the units may be capable of 18 knots, there should be none which cannot be depended on for tactical evolutions at 15 knots speed. To attain this obsolete vessels must be replaced or modernized in accordance with the latest developments in engineering.

### ARMORED CRUISERS, COAST-DEFENSE VESSELS, CRUISERS.

Next in importance to the battleship is the armored cruiser, which forms a prominent feature of the latest foreign ship building programs. Vessels of this type have primarily high speed and great coal endurance; they are usually of large size and are given as much protection and as intense fire energy as practicable, but these qualities are secondary. While they may be used to supplement the fleet of battleships if necessary in maintaining command of the sea at strategic points, and are most useful adjuncts of such a fleet, it is held by many foreign writers that they have also a distinct field of operations. While these operations will not be decisive in their results in a war between great naval powers, yet the sudden opportune arrival of an armored cruiser, or of several of them at well-chosen points, may have a great influence on the war. Their size, speed, and armament enable them to engage successfully any except battleships. They are regarded as the most effective type for carrying on a cruiser war of depredation. It was formerly held by some writers that armored cruisers would prove superior to battleships, owing to their greater speed, but since the close of the war with Spain such claims are seldom heard. It is worthy of note, however, that with the effort to give increased speed to battleships and better protection to armored cruisers these two types tend to approximate.

Armored coast-defense vessels appear to be practically ignored in present foreign programs for the increase of modern fleets. There are two reasons for this, the first being the general belief that naval force will be mainly employed in sea contests rather than in merely defending home shores against attacks by an enemy. The second reason for not building new armored coast-defense vessels is that in the European navies it is felt that they already have a sufficient number of vessels of this type, and that future needs will be supplied by taking from the active armored fleet the older vessels as these are replaced from time to time by others of later type. In the British navy, in pursuance of this plan, the obsolete ships formerly stationed in home waters as coast-guard and port-guard ships have been succeeded by vessels which, though old, are still efficient. In Germany the same end is attained by the rule assigning a definite length of service—twenty-five years—to a battleship as such, upon the expiration of which she must be replaced by a new ship and transferred to the list of coast-defense ships. The monitor type is regarded abroad as having been thoroughly discredited by the experience of the war.

The need of making liberal provision for the building of cruisers is fully recognized abroad, and this has simply been emphasized by the recent war. Their essential qualities are speed, coal endurance, and means of coaling rapidly; with these characteristics their usefulness will be so great that no admiral will be likely to feel that he has enough of them. It is generally accepted that this is as true of cruisers today as it was of fast frigates in the days of Nelson. Whatever method of scouting or of search be adopted, the finding of a fleet at sea must always remain a very difficult problem, in view of the obstacles of limited horizon, unfavorable

weather, fog and darkness. Very small cruisers and light-draught gun-boats continue to be provided, their number and varying qualities depending upon the special needs of the different navies for cruising or for minor shoal-water operations.

### TORPEDO BOATS AND DESTROYERS.

With regard to torpedo boats and destroyers, foreign naval opinion is practically unanimous that the war has thrown no new light on the question of their value when used for the purposes for which they are intended. Navies which held them in high esteem before still continue to do so. Their vulnerability has long been recognized, as has the fact that they are peculiarly a weapon of opportunity, requiring for their successful use favorable conditions which may or may not be present at a given time and place. Their usefulness in the training of young officers is universally conceded. Organized as instructional flotillas or as a part of the mobile defense of ports, exercises with them are continuous and systematic and are not confined to the period of the annual manœuvres. Torpedo boat destroyers, simply larger torpedo boats with increased gun armament and better sea-going qualities, are coming more and more into favor as the best type. In Germany it has been decided to build no more small torpedo boats. New ones are to be of the destroyer class, and will be as large as the former division boats. Foreign torpedo officers believe that while torpedo boats are an accessory upon which dependence cannot always be placed, yet their presence will have great moral effect, and that they are capable of very effective work. In foreign squadron manœuvres night attacks by torpedo boats have very frequently been judged to be successful, and it is urged that prior to the late war the number and tonnage of vessels sunk by torpedoes exceeded those destroyed by gun fire. Submarine boats have not received much attention abroad of late, except in France, where a number of them of new type have been authorized.

While it has not yet received embodiment to any extent in new construction, foreign comment shows a clear apprehension of the need of a sufficient number of vessels for supply and auxiliary service, having the speed and other qualities requisite for efficiency. These are seen to include colliers fitted to give coal rapidly at sea, distilling ships to replenish fresh water for boilers, repair ships to obviate withdrawal for any except large repairs, ammunition vessels to make good the enormous expenditure of the rapid-fire guns, provision ships with refrigerating plants, telegraph cable steamers, fitted also for laying out submarine mines and for countermining operations, powerful tugs with mine-laying as well as wrecking facilities, and hospital ships.

### ARMAMENT—RAPID-FIRE GUNS IN FAVOR.

The view that a rapid-fire battery of moderate caliber, giving the greatest possible fire energy, should constitute the main reliance of battleships has been confirmed in the minds of foreign officers by the war with Spain. In the British navy the 6-inch rapid-fire gun continues in favor for this purpose. In all progressive navies rapid-firing guns are displacing those of older type. While a large allowance of guns of the smaller calibers is provided for special purposes, yet it is claimed by many experts abroad that in view of the abolition and removal of wood from ships, now in progress everywhere, these smaller guns will never again have the same relative importance that they had at Santiago, where it is noted that engines and boilers were not injured, steering gear was not damaged, and very few guns were dismounted. The unarmored portions of the sides of the Spanish ships simply served to explode the small projectiles, which killed and demoralized men and started uncontrollable fires. But better protection will hereafter be given, and rapid-fire guns of medium caliber will, it is claimed, become the crew-destroying weapon.

It is generally believed that future battleships will not carry any guns of larger caliber than the 12-inch, and by many foreign officers this is held to be excessive. It is claimed that such guns being accessory in their nature, their efficiency is not at all proportionate to the sacrifices which they require. An immediate effect of the war was to reduce the caliber of the heaviest guns of the new German battleships to 9.45 inches. It is accepted that the armament of cruisers, whether armored or not, should be composed essentially if not entirely of rapid-fire guns. Nearly all navies are endeavoring to accelerate their gun fire by improvements in mechanism and by the use of metal cartridge cases for all but the largest guns. The question of the best method of supplying ammunition, especially to meet the requirements of rapid-fire guns, is receiving earnest study abroad. As an adjunct to the battery, various ingenious appliances, optic or electric, are in use abroad to communicate ranges and instructions to the guns. It is recognized that a hostile shell may paralyze this service, but the object will have been gained if superiority of gun fire can be achieved at the beginning of the battle.

Smokeless powder has long been considered abroad to be absolutely essential, and our recent experience has demonstrated the fact most fully. Such powder should be stable, practically without visible products of combustion, innocuous to the crew in action, and noninjurious to the bore of the gun, besides giving the requisite initial velocity. Foreign experience has shown that these qualities are difficult to obtain in satisfactory combination.

There is universal agreement abroad in the opinion that no provision should be made for the use of torpedoes by battleships and cruisers except in under-water tubes. On this point the experience of the naval battle of Santiago has only strengthened and made more general a view which has been gathering force for several years past, a view entirely independent of any consideration of the value of the torpedo in its proper sphere. Many progressive torpedo officers, as well as others, now hold that armament with this weapon should be restricted to torpedo boats, and good arguments are offered for its abolition from cruisers and battleships. But conservatism still keeps a few on board, and new designs for battleships in the desire for a maximum of offensive and defensive power retain submerged tubes. It is argued that recent improvements practically double the effective range of the torpedo.

### ARMOR PROTECTION MUST BE WIDELY DIFFUSED.

In no respect has there been a more marked crystallization of naval opinion abroad of late than that which has taken place on the question of the best distribution of the weight assigned to armor in a ship's design. All officers are now in accord that protection must be widely diffused,



and that it cannot be restricted to the water line and gun positions. The trend of professional opinion in the British navy has been in this direction for some time past, as is evidenced by the latest battleships and armored cruisers. Elsewhere there have been designs of date not much prior to the war with Spain which showed a very wide expanse of side without protection, while heavy armor guarded a few parts. A few years ago France produced, in the Dupuy de Lome, an armored cruiser lacking in size, but having admirable general protection, but there has not been adherence to this feature. Some of the later foreign armored cruisers have no protection between the water line belt and the gun positions on the main deck, but current discussion shows that in battleships and armored cruisers laid down hereafter this will not be repeated. The appalling disablement of crew which, under well-directed gun fire, may occur on board armored ships lacking widely distributed protection is now fully appreciated. The need of extending the armored water line belt to the extremities is also urged, and the protection of the personnel in the conning tower is regarded as essential.

The recent war confirmed and impressed the lesson of that between China and Japan as to the absolute necessity of protection of the personnel. Proving-ground tests have shown for the latest new process face-hardened armor such a remarkable resistance to penetration that there can be much reduction of thickness, thus enabling the need for covering a more extended area to be met, although at increased cost. There has been a prompt acceptance of the new conditions. In foreign armor contracts quality is made the feature of paramount importance, cost being a secondary consideration. The best type of armor procurable at the time is purchased. So general is this that it holds good not only in the more important foreign navies, but even in some whose expenditures are necessarily much restricted. The fact is fully realized that if a ship whose armor is contracted for today is hereafter to be tested in battle against an opponent having protection of a superior quality, permitting better distribution, this one point may have a decisive influence on the result.

#### SPECIAL FEATURES OF CONSTRUCTION AND EQUIPMENT.

The destruction of the Spanish ships by fire caused by American shells has led to universal effort to abolish wood and combustible materials from naval vessels. This effort is marked by such vigor that its results may practically be regarded as accomplished. In some of the latest ships the furniture is of metal or of fireproofed wood, the steel bulkheads have ornamental asbestos covering, and the steel decks are given a plastic nonflammable coating. Decks partly of wood are being replaced by steel. In clearing ship for action nothing combustible is permitted above the protective deck. Canvas boats permitting disassemblage and stowage below will be tested for some purposes.

The action of the French budget committee in declining to make provision for the repair and maintenance of certain old wooden ships recognizes the lack of military value of such vessels. A step in the same direction is the replacing of old wooden French ships for colonial service by others of more modern type. In these measures France is but following the policy already adopted in other navies. Provision for extinguishing fire has been much extended and greatly increased. Fire mains are now carried under the protective deck, with numerous vertical leads from them.

The general adoption of water tube boilers by progressive foreign navies has passed beyond the stage of discussion and may be regarded as an accomplished fact. The only point now remaining open in this respect is the question of the best type. Search lights, rapid-fire guns of the secondary battery, flotillas of picket boats when at anchor, and numerous flanking torpedo boat destroyers and cruisers when under way, form the chief defense of battleships against torpedoes. Recent improvements and attachments give torpedoes much greater range and accuracy than they have had heretofore and increase the need of defense against them. Thus the best position for search lights is one of great importance and has been much investigated abroad. The present practice is to mount some search lights aloft and others as low as they can be used in a seaway. The low ones, having their beams parallel to the water, are best for picking up an object on the surface, but their beams blind the gun pointers of the secondary battery. The lights which are placed high serve to illuminate the object after it is picked up. It is evident that cooperation between the search lights and the battery is necessary. Though some foreign battleships still have torpedo nets, they are no longer regarded with favor abroad.

Military masts are considered important for battleships. The tendency is to shorten them, and their development is in the direction of armored towers with circular stairways, enabling men to go aloft to the fighting tops and to have ammunition supplied to them therein under protection. There is communication from the tops to the conning towers to facilitate reporting ranges and signals. For cruisers the present tendency seems to be to use pole masts. The arguments against an extensive use of longitudinal bulkheads below the protective deck, which followed the capsizing of the Victoria after her collision with the Camperdown, have been counteracted this year by the fact that the German armored coast-defense ship Aegir was saved from sinking as a result of collision during fleet manœuvres by flooding compartments on the side opposite the injury, thus heeling the ship sufficiently to bring the leak above the water line. It is now held that valves to permit the passage of water across to opposite compartments will obviate the danger of capsizing. Cellulose protection is still used. In some cases cork is preferred, in spite of its greater weight. Some authorities hold that to avoid any danger of corrosive action it is well to keep the cofferdams empty, clean and dry, ready to be packed with cellulose in case of war.

#### THE MEN AT THE GUNS.

Efficiency of the personnel is universally recognized as of supreme importance. In no direction does this manifest itself in a more marked degree than in the intense and continuous effort shown abroad to train gun pointers, with the object of having them attain the greatest possible practical efficiency. Prior to the war with Spain the published statements of results of foreign target practice gave some remarkable percentages of hits. Since the war, owing to greatly increased interest in the subject, still better results are said to have been achieved. Not making sufficient allowance, perhaps, for battle conditions, foreign analysis

of the effects of gun fire at Manila and at Santiago generally results in the assertion or points to the inference that the American gun pointers showed much room for improvement, both in the accuracy and in the rapidity of their fire, although they were vastly superior to the Spanish. In so far as these discussions are derogatory to the American gun pointers the comment is appropriate that never before have fleets been so utterly destroyed through gun fire.

In the British navy the allowance of ammunition for target practice and the amounts paid for prize firing have, it is stated in the press, been largely increased within the past year. The Excellent gunnery training establishment on Whale island has been enlarged, and improvements are making to increase the facilities for target practice. The Sheerness gunnery school is reported in the press to be undergoing enlargement. English newspapers report negotiations in progress to secure land to permit the Cambridge gunnery school at Devonport to be established on shore, in accordance with the method followed at Whale island. The same plan adopted there will probably be adhered to of having vessels to carry details to sea frequently for target practice underway under varying conditions of weather. In the French navy the training of gun pointers has for some time past been a matter of special effort, and since the recent war these efforts have been redoubled. The exercises appear from press accounts to be of a very practical nature. In the German navy prizes are offered for successful target firing to a greater extent than formerly, and nothing is left undone to stimulate interest in the practice. Press reports show that the vessels in commission at Kiel and Wilhelmshaven go to sea almost every day for target practice, which is not confined, as formerly, to their going out for manœuvres. Target practice is no longer confined to ships in commission, but also includes the vessels in reserve, which go out with reduced complements, in order to familiarize the personnel with the ships and to keep the vessels in serviceable condition. Training is by no means confined to target practice, but goes on actively in every practicable way in all important foreign navies.

The tendency is very marked abroad to have men who are selected for special courses of instruction, as well as those awaiting distribution to the fleet, quartered in barracks ashore rather than on board of old hulks. It is found that better hygienic conditions can be obtained in barracks, and the results are more satisfactory in many ways. Rapid coaling is now regarded as an essential requirement of the personnel and has received much attention, particularly in the British navy, where it is no longer regarded as mere drudgery, but has become an important evolution in which officers as well as men often take part, the greatest rivalry existing among the ships of a squadron. Items which have appeared recently in English newspapers indicate that through thorough training of the fire-room force marked progress has been made in the extremely important matter of diminishing the amount of smoke discharged from the smoke-pipes.

The problem of securing an efficient naval reserve has long been a subject of serious study abroad, particularly in Great Britain, where the question assumes special importance, owing to the manning of the fleet being there dependent upon voluntary enlistment. The measure now in force in the British navy requiring new reserve men to serve on board ships in commission for a sufficient time to give them some idea of naval duties will, it is believed, have good results.

#### IMPORTANCE OF RAPID MOBILIZATION.

The importance of rapid mobilization is fully appreciated in foreign navies. Some of them, profiting by the experience gained in the annual tests in connection with naval manœuvres, have reached a high degree of proficiency in this respect, as is demonstrated by the facility with which officers and crews go on board strange ships to be temporarily commissioned, assume their duties at once, enter promptly upon the service to be performed, and upon its completion lay up their ships and turn in their stores without delay. The prompt mobilization last year upon short notice of a British reserve fleet, including well-drilled flotillas of torpedo boat destroyers, in view of threatening foreign relations, afforded a notable example of the value of practice in such work.

A movement in connection with naval matters which has received a remarkable impetus within the past few years in several maritime countries is the development of naval leagues—associations having for their chief aims the diffusion in popular form of information concerning the navy of the nation and advocacy of its maintenance and increase. The league usually includes members of the imperial or royal family and comprises all classes of people. The dues are generally small. The amount of literature distributed throughout the country by the organization is very great, presenting in attractive shape, in periodicals, maps and other publications, such information concerning the navy as is of general interest, with reasons for its maintenance, set forth in simple but convincing form. The effect is far-reaching. Even in those countries where the burden of large armaments is severely felt, any proposition offered in a legislative body looking to a reduction of naval expenses meets with determined opposition—an opposition prompted by the general desire of the people that the efficiency of their navy shall not be lessened. This affords a manifestation of the phenomenon which has excited comment within recent years, that coincident with the extension of democratic methods of government there has been evinced on the part of the people an increasing pride in their military and naval forces as representing in concrete form an expression of the strength of the nation.

The project of opening a safe, wide, and deep channel through the southwest pass of the Mississippi river by an expenditure of about \$8,000,000 was discussed by the committee on rivers and harbors at Washington a few days ago. A large delegation was present, representing not only the commercial and navigation interests of New Orleans, but the states along the river, and the northwest in general. The speakers favored the maintenance of the south pass as well as the development of the southwest pass.

It is reported that the Hamburg-American line will shortly introduce a new kind of fuel on their steamers. It is a semi-fluid petroleum which is imported from Borneo. The expectation is that it will reduce the number of firemen and result in an economy of space.



## ALONG THE ATLANTIC COAST.

WHAT SHIP BUILDERS ARE DOING AT VARIOUS POINTS FROM MAINE TO THE GULF—NEW ORDERS, LAUNCHES, ETC.

The steamer Northumberland, built by the Neafe & Levy Ship & Engine Building Co. for the Weems Steamboat Co. of Baltimore, was launched last week. The new steamer is 200 feet over all in length, 41 feet beam and 12 feet 3 inches depth of hold. Her hull is constructed of steel, while her upper works are of wood. She will be fitted up with triple expansion engines with cylinders of 18, 28 and 45 inches diameter and 30 inches stroke, steam being supplied by two steel boilers of the gunboat type, each 9 feet 6 inches in diameter and 20 feet long. The keel of the Denver, cruiser for the United States navy, will be laid by this company shortly. Neafe & Levy are now building three torpedo boat destroyers—the Bainbridge, Barry and Chauncey. Within the past two weeks they have signed three more contracts—the first with the city of Philadelphia to build the new police and fireboat Samuel H. Ashbridge for \$83,200, from plans of their own, which it is reported will make her the model fireboat of the United States; a steel tug, 135 feet over all, for Frank W. Munn of Philadelphia and another of the same size for the Rockland and Rockport Lime Co. of Portland, Me. A contract for three steel barges and for several other tugs were refused this week on account of the large amount of work already on hand.

The Augusta, built by the Neafe & Levy Ship & Engine Building Co. of Philadelphia for the Chesapeake Steamship Co. of Baltimore, has just completed her maiden trip between Baltimore and Norfolk. Her general dimensions are: Length between perpendiculars, 246 feet; length over all, 260 feet; breadth of beam on main deck, 46 feet; breadth of water line, 42 feet; depth of hold, 17 feet 4 inches. The motive power consists of an inverted vertical triple expansion engine of the latest and most approved type.

The first boiler to be installed in a government vessel by the Wm. R. Trigg Co. of Richmond, Va., was placed on board the torpedo boat Stockton last week without accident. The boilers of the torpedo boat Shubrick are now being placed on board by the same firm. It is reported that the submarine torpedo boat Plunger will be turned over to the William R. Trigg Co. for the removal of her steam machinery and its substitution with some other and more practical system of propulsion.

A contract for the building of a wooden pier with appurtenances near Coenties slip, East river, New York, has been awarded to Bernhard Rolf whose bid was the lowest at \$45,433. When completed the pier will be known as Pier (new) No. 5. The contract for dredging north of West Thirty-Fourth street, North river, was awarded to the W. H. Beard Dredging Co. at 12 4-10 cents per cubic yard.

A unique vessel has just been completed at the works of James Bayles, Port Jefferson, N. Y., for Capt. Fred. G. Palmer of Colon. The vessel is 158 feet over all, 18 feet beam and 7½ feet deep. The Intrepid, as she is called, draws but 3½ feet of water and is especially designed for trade in the shallow inlets of South America. She has an auxiliary screw and a gasoline engine of 25 horse power.

The regular weekly statement of the bureau of navigation, treasury department, lists the schooner Powel, recently completed at Port Richmond, N. Y., as of 1,201 gross or 1,142 net tons. The steamer Admiral, just completed at the yard of the Detroit Ship Building Co., is given as of 4,651 gross or 3,547 net tons.

The announcement is made by the New York Ship Building Co., which is erecting a large works at Camden near Philadelphia, that up to the present time \$3,600,000 of its capital has been paid in. The company will build engines and boilers as well as ships. Its capital stock is \$6,000,000—all of one kind.

On her builders' trial recently on the Delaware river the new twin-screw steamer Pennsylvania, built at Roach's yard, Chester, for the New York, Philadelphia & Norfolk Railroad Co., made the high speed of 22½ miles for an hour's run. She is to ply between Cape Charles and Cape Henry.

The Hamburg-American Steamship Co. has closed a contract with R. P. & J. H. Staats for the erection of a new pier on property recently purchased by the company in Hoboken. The pier will be 105 feet wide and 200 feet long and will be used principally for the storage of freight.

The four-masted schooner Calumet, building in Bath, Me., for John S. Emery & Co. of Boston will be launched this week. Her dimensions are: Length of keel, 180 feet; beam, 40 feet; depth, 18.5 feet, with a carrying capacity of 1,700 tons.

Thomas Manning is building for Lorenzo Blackstone of Norwich, Conn., through Townsend & Downey at their yards, Shooter's Island, New York, a house boat 85 feet long, 30 feet wide and about 2 feet 6 inches draught.

The barge Benavides for the Bee Line Transportation Co. of New York has just been launched at the ship yard of the New England Co., Bath, Me. Three barges for this company are in course of construction at this yard.

Plans have been completed by Arthur Sewall & Co. of Bath, Me., for two four-masted steel ships to be larger than any vessels now included in the Sewall fleet. Negotiations are now being made for building material.

It is reported that the Chesapeake Steamship Co., which has been incorporated in Baltimore with a capital stock of \$350,000, will build a new steamer to ply between Baltimore, Old Point Comfort and Norfolk.

A delegation of Marine Hospital officials visited the Kensington Engine Works of Philadelphia last week to inspect the disinfecting ship Sanator. Her equipment of fumigating apparatus is now complete.

The ship yard of H. B. Kibby at New Whatcom, Wash., which has been idle for several months, is again in operation. Fifty men are now at work and the force will ere long be increased to one hundred.

Keels of the two 12,000-ton steamers which the Cramps are to build for the International Navigation Co. will shortly be laid. The ships will be 560 feet long and 60 feet beam with a speed of 17 knots.

The Winsor line steamships Spartan, Parthian and Indian, trading be-

tween Philadelphia and Boston, are to be lengthened at the ship yard of the Harlan & Hollingsworth Co., Wilmington, Del.

The Batchelder boat manufactory at Jamestown, N. Y. was severely damaged by fire a few days since. The loss is estimated at \$5,000, partially covered by insurance.

Lawrence Jensen of Gloucester, Mass., is building for F. S. Russell of Boston a schooner yacht 51 long over all, 31 feet water line and 14 feet beam, to be ready May 1.

The Thomas McLaughlin Iron Works, foot of Essex street, Jersey City, are going to engage in the marine engine and boiler repair business and make heavy forgings.

Mather & Wood of Port Jefferson, N. Y., expect to begin work within a short time on a four-masted schooner of 1,500 tons burden.

The New Haven Steamboat Co. has announced that a contract will shortly be let for a new steamer for the line on Long Island sound.

Cobb, Butler & Co. of Rockland, Me., have a contract for a double-deck four-masted schooner for John S. Emery & Co. of Boston.

The Jackson & Sharp Co. of Wilmington, Del., is building a 185-foot freight propeller for the Barrett Mfg. Co. of Philadelphia.

During the present season the Paul Mohr Co. of Portland, Ore., will build three small steamboats for Columbia river navigation.

## PROBABLY THE WORK OF A CRANK.

Some one signing himself "Vessel Owner" has sent out from Chicago to nearly everybody interested in lake shipping an alarming and poorly-written letter urging the adoption of the Corliss Niagara river dam bill. Of course it was not expected by even the most ardent supporters of the Niagara dam proposition that any action would be taken by the present congress on the subject, so that the anonymous letter from Chicago, if it is not the work of a crank, and if any attention at all is paid to it will be hurtful to the Corliss bill, especially on account of the abuse it contains relative to Major Symons' position in the matter. The letter, changed in some parts so as to make it readable, is as follows:

"There is a bill now before congress, introduced by the Hon. J. B. Corliss of Detroit, providing for the erection of a regulating dam in the Niagara river at the foot of Lake Erie, to maintain a uniform depth of water in all harbors, no matter what the conditions are or the effect the Chicago drainage canal may have on the lake levels. It is now before the committee on rivers and harbors, and would undoubtedly have been reported to congress from that committee had not Major Symons, the government engineer at Buffalo, and a few deluded people down the Niagara river, opposed it, on the ground that it might possibly hurt them, when in reality in the end they must be greatly benefited, as such a dam would eventually result in giving all ports on the river below Buffalo a 20-foot channel, by means of a lock or canal through or around the proposed dam, through which the largest vessels could pass up or down, loaded to their full capacity, while now only the lightest-draught vessels can come up through the narrows without a load, and at a great consumption of coal. And why should a few thousand people oppose that which will benefit millions? The dam proposed has been favorably reported upon by a United States board of engineers, the deep water ways commission, and such eminent engineers as Col. Raymond, Prof. Geo. Y. Wisner, F. S. Cooley and Mr. Noble.

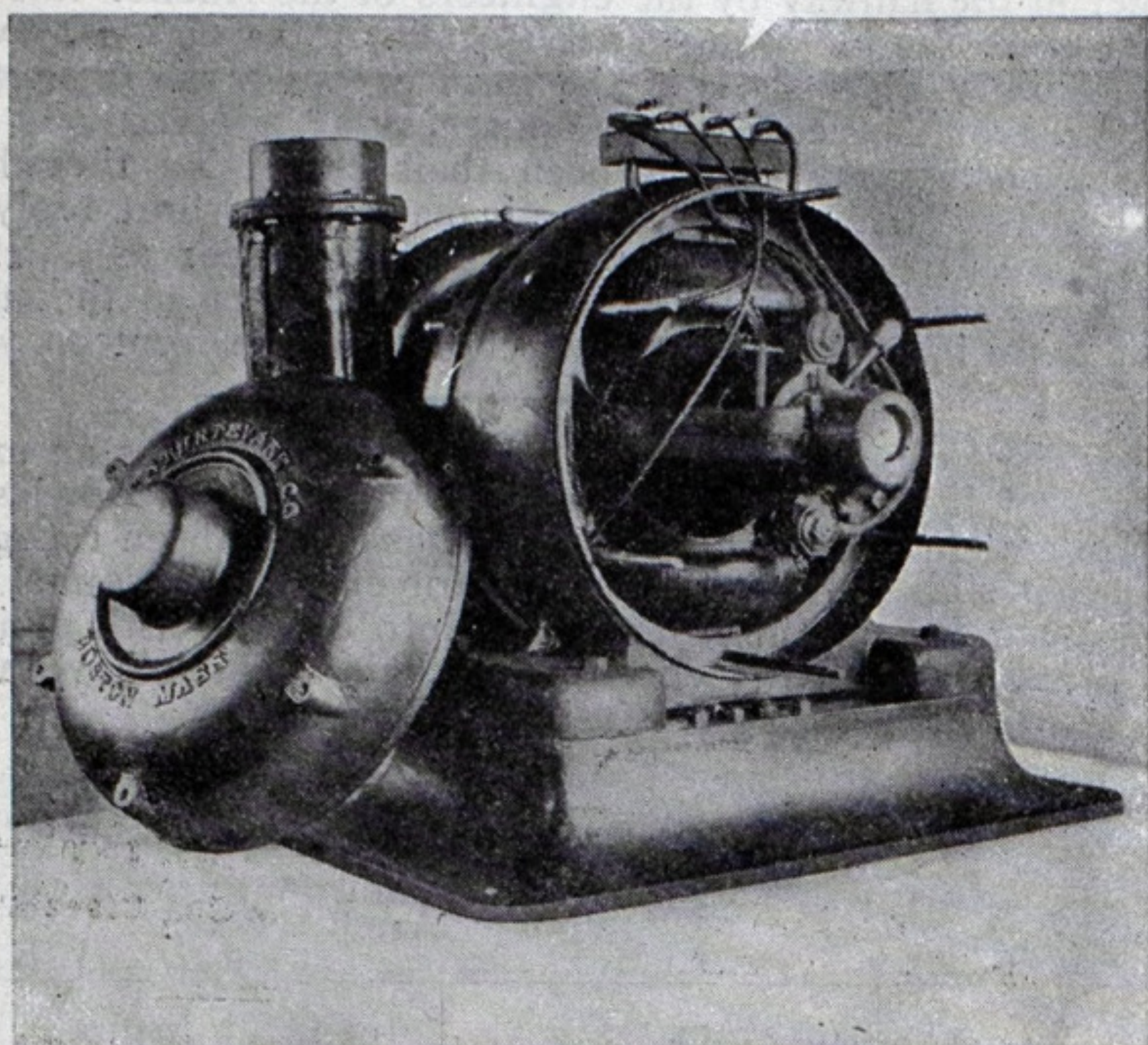
"The true reason for Major Symons' opposition is undoubtedly in the fact (as he inadvertently acknowledged) that he was not consulted, and for the reason also that he is inclined to favor a few large corporations down the river below Buffalo, who seem to own him body and soul; and through his ignorance and desire to help these interests, he spent hundreds of thousands of dollars of the government's money blasting out the channel of the Niagara river, which has resulted in drawing down the lake levels nearly 3 feet in the last few years, and the channel which he hoped to deepen is just that much shallower than it was originally, for as soon as the stored waters of the lakes were drawn down by the deepening and enlarging of the outlet, the outlet itself fell accordingly.

"Believing you always have the navigable interests of the great lakes at heart, I appeal to you to at once write your congressman to see the Hon. J. B. Corliss and encourage him in his great work; also to see the committee on rivers and harbors and impress upon them the importance of reporting favorably upon this bill, and at the same time the secretary of war, urging him to remove Major Symons to a less important post, where he can do less harm to the marine interests of the great lakes. Please do not lose one moment in taking this subject up or it will be too late, for if this bill is delayed or dies in the committee, and work is not at once commenced on the proposed dam, I shudder for the consequences. Chicago has opened her drainage canal, through which 40,000 cubic feet of water per minute are now being drawn, with the expectation of increasing it to 80,000 cubic feet to protect health and sanitary conditions. The forests have largely been cut off, and all the indications are that for the next two years the evaporation from the lakes will be great and the source of supply unusually small. Any man can figure for himself the consequence. Take 40,000 cubic feet per minute and divide the number of surface square feet in the lakes by this sum, and you will find that within two to three years the lake levels must be drawn down nearly 2 feet. This is just as certain as the drawing off of the water from the smallest mill pond or wash bowl, unless the outlets are curtailed. Whatever time is taken in lowering the lakes must be given up to restoring them after the outlets are controlled; consequently I predict to an absolute certainty that unless something is done at once to husband these waters, many large vessels will be aground by the spring of 1901 and unable to get to their docks, and great injury will be done the marine interests of the great lakes for at least a year, as it will surely take that length of time to restore the waters to their nominal level. You cannot afford to run a risk of this kind, and I again appeal to you to take this subject up at once with your representative in Washington, for during every month that it is postponed 1,728,000,000 cubic feet of these precious waters will be drawn off. Without an adequate curtailing at the other end, which is absolutely necessary, great damage will be done, and it will take just as many months or years to restore this damage as there are delays in attending to it."



## NOVEL TYPE OF ELECTRIC FAN.

In the accompanying illustration is shown an electric fan of recent design, manufactured by the B. F. Sturtevant Co. of Boston. The motor, which is of the bi-polar type, is supported upon a substantial pedestal carrying upon one end the casing of the fan, which is arranged so as to be adjustable about the center of the motor, thus making it possible to discharge air in any given direction. A single cradle or double yoke carries both bearings, which are of the self oiling type and self adjustable.



They are thus kept in constant alignment, and it is possible to remove the cradle and armature together. The armature itself is of the drum-wound type, while the commutator is built up of drop-forged copper segments. Self feeding and self adjusting carbon brushes with socket holders are employed.

The most important feature of this combination is the manner of enclosing the motor, so as to keep it free from dust, and to make possible the operation of the fan in a dusty atmosphere. The cast iron end of the casing is clearly shown in the illustration, as well as the bolts projecting from the field ring. These bolts pass through corresponding holes in the cover, so that the same may be securely held in place. The removable cap in the center of the cover makes it simple to reach the bearing and brushes without disturbing the main cover itself.

Central Passenger Association mileage tickets are accepted for passage on all trains of the Nickel Plate road. 31 Mar. 16.

## WASHINGTON NOTES.

The United States court of claims at Washington has decided that the Spanish squadron at Manila was inferior in strength to the American squadron and that therefore Admiral Dewey and his officers and men are entitled to prize money in the sum of \$100 for each person on board the Spanish ships destroyed. Had the Spanish force been superior Dewey and his men would have been entitled to \$200. An appeal may be taken. Dewey under the award will receive \$9,570.

The senate committee on commerce has recommended that the bill to reconstruct the Thetis for service as a revenue cutter on the Pacific coast be passed. The work will cost about \$50,000. The Thetis was constructed and originally designed for service in Arctic waters. The machinery and upper works require extensive repairs to fit the ship for efficient service. The revenue cutter work along the Pacific coast is of a rough nature and an unusually staunch vessel is required.

At the invitation of the secretary of the navy members of the house committee on naval affairs will inspect the battleship Kearsarge during the present week. The committee is particularly anxious to see the workings of the double turrets on the Kearsarge, the first vessel of the navy upon which they have been installed.

House bill No. 8018, which provides for the construction of a steam revenue cutter for service in the Gulf of Mexico with headquarters at New Orleans, has been reported without amendment by the committee on interstate commerce. This committee has also reported without amendment the bill to promote the efficiency of the revenue cutter service.

The house has passed a bill authorizing the restoration of the old frigate Constitution "as near as may be consistent with her preservation in the same condition as regards her hull and rigging as she was when in active service" at the expense of the Massachusetts State Society Daughters of 1812.

The Japanese cruisers Chitose and Kasagi, built in this country, and the Russian ships building at the Cramp works have adopted the Franklin life buoy, invented by Rear Admiral Hichborn, and which is so extensively used in the United States navy.

The naval board of construction is considering the advisability of converting the Topeka, now at the Boston navy yard, into a transport.

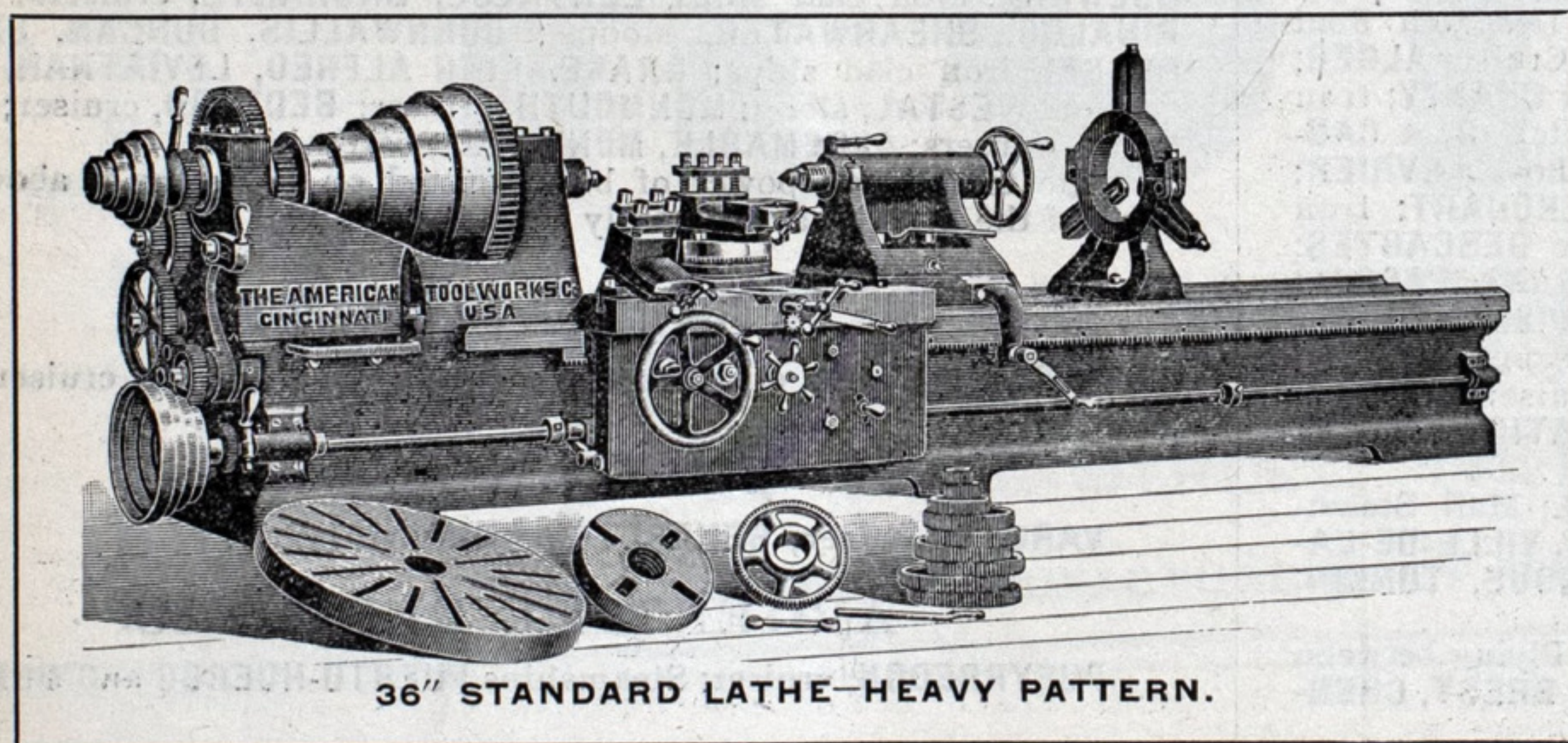
The navy department is contemplating the partial reconstruction of the cruiser San Francisco.

Secretary Long has issued an order making swimming exercises compulsory in the navy.

As the navy department has just ordered from the New York Air Compressor Co. two 500 feet compound air compressors for installation in the Boston navy yard, it is expected that pneumatic tools will be extensively used at that yard and specifications for a large quantity of these tools are therefore looked for.

The auxiliary cruiser Buffalo will be used as a training ship for landsmen and will be placed in commission about April 1.

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Graf Adolf Strasse, 83-87

ANTWERP: Nyssens Frères, 33 Rue des Peignes.

BERLIN: de Fries & Co., Act. Ges.,  
Kloster Strasse, 13-15.

PARIS: Roux Frères & Cie., 54 Boulevard  
du Temple.

MOSCOW: Alfred Stucken.



## AROUND THE GREAT LAKES.

As the strike of machinists in Chicago has extended to the works of the Chicago Ship Building Co., that large concern has another cause of delay to contend with in the several steel vessels which they have under construction. The machine shop at the Chicago works is the most important of the several shops operated by the American Ship Building Co.

It is understood that the Jenks Ship Building Co. of Port Huron will put down at its works another steel steamer of Canadian canal dimensions as soon as the canal steamer building for Capt. Thos. Wilson of Cleveland is launched, which will be in about a month. The 6,000-ton steamer building for the Wilson line at the same yard will probably not be completed until September next.

About five hundred men are now employed at the works of the Craig Ship Building Co., Toledo, and in addition to a machine shop projected recently the company is also at work on a foundry and boiler shop. The steamer Harlem, which has been in the dry dock at the Craig works for several months past, will be in the water in a few days, and all that will remain to be done to put the boat in shape for navigation will be some work on the engine and boilers and the refitting of cabins. The Gettysburg, Presley, Redington and three or four other vessels are also undergoing repairs at these works.

David Carter of Detroit, general manager of the Detroit & Cleveland Navigation Co., who reached his sixty-eighth birthday a week ago Tuesday, will celebrate the forty-eighth anniversary of his service with the D. & C. Co. in April next. In 1852 he became purser of the steamer Forest City, owned by John Owen and Ira Davis. With the Forest City, then owned by Eber Ward, these two steamers controlled the route between Detroit and Cleveland. The line was commonly spoken of as the Detroit and Cleveland line, and when in 1858 the two boats became merged in a common ownership the name clung, although the line was not duly incorporated until 1868. Mr. Carter was made agent for the line in 1861 and became general manager twenty-years later. He is a man of excellent executive ability and unfailing judgment of men.

There is no special significance attached to the fact that Messrs. W. L. Brown and W. I. Babcock of the Chicago Ship Building Co. are connected with the management of the New Manitou Steamship Co. The Austrian and Leopold interests in the Lake Michigan & Lake Superior Transportation Co., which operated the Manitou, have been separated and Messrs. Brown and Babcock, alike to Mr. A. W. Goodrich, are simply interested as stockholders in the new company that is to operate the Manitou. Of course the influence of these men may result later in the Manitou Steamship Co. building or acquiring more vessels and spreading out in the passenger business. Officers of the new company are: President, N. F. Leopold; vice-president, W. I. Babcock; secretary and treas-

urer, H. W. Thorp; executive committee, H. F. Leopold, A. W. Goodrich and W. L. Brown; general passenger agent, Joseph Berolzheimer.

Robert Learmonth of Buffalo, who has been chief engineer of the Anchor line of steamers for sixteen years, is also well known as the inventor of a feed water heater. He resigned his position with the Anchor line a few days ago to look after the business he has built up on his own account. He rented an office in the White building, Buffalo, and was about to enter it with a view to looking after the furnishings when he was met in the hallway by the engineers of the Anchor line and escorted into the office of the government steamboat inspection service. There John E. Mulroy, chief clerk of the service, told Mr. Learmonth, in a brief address, that the engineers so appreciated his intercourse with them during the sixteen years he had been their chief that they had furnished his office as a gift. Mr. Learmonth managed a short reply in thanks, but it took all his nerve to keep up. His successor as chief engineer of the Anchor line is Charles J. Fox, first engineer of the steamer Mahoning, and who has been with the Anchor line for seventeen years.

The Scientific American for March 3 contains an excellent biographical sketch of Naval Constructor Francis Tiffany Bowles. Mr. Bowles' administrative and business capacity has always been recognized in the navy as well as his unflinching demand for efficient personnel in the navy yards. This has frequently brought him into conflict with politicians and led to investigations of his conduct of affairs, which have always resulted in credit to himself and confusion to his enemies.

## VALUE OF STOCKS—LEADING IRON AND STEEL INDUSTRIALS.

Quotations furnished by HERBERT WRIGHT & Co., Cleveland, date of March 7, 1900.

NAME OF STOCK.	OPEN	HIGH	LOW	CLOSE
American Steel & Wire.....	54½	54¾	53½	54¾
American Steel & Wire, Pfd.....	90½	.....	.....	90½
Federal Steel .....	51	51¾	50½	50¾
Federal Steel, Pfd.....	72	72½	72	72½
National Steel .....	41½	43	41½	43
National Steel, Pfd.....	94¾	.....	.....	94¾
American Tin Plate .....	30	31½	30	31½
American Tin Plate, Pfd.....	80½	.....	.....	80½
American Steel Hoop.....	33½	35	33¾	33¾
American Steel Hoop, Pfd.....	.....	.....	.....	.....
Republic Iron & Steel.....	20	21½	20	21¾
Republic Iron & Steel, Pfd.....	66	67¾	66	67¾

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MESSAGERIES MARITIMES: Cargo Steamer ORTEGAL; Mail Steamships SINDH, AUSTRALIEN, POLYNESIEN, ARMAND-BEHIC, VILLE-DE-LACIOTAT, ERNEST-SIMONS, CHILI, CORDILLERE, LAOS, INDUS, TONKIN, ANNAM, ATLANTIQUE.

COMPAGNIE DES CHEMINS DE FER DE L'OUEST, (Plying between Dieppe and Newhaven): Freight Steamers ANGERS, CAEN, BREST, CHERBOURG; Fast Steamers TAMISE, MANCHE, FRANCE.

## RUSSIAN NAVY.

Iron Clad Frigate MININE; Gunboat GROZASTCHY; Imperial Yacht MAREVO; Imperial Yacht STRELA; Gunboat GREMIASCHY; Gunboat OTVAJNI; Imperial Yacht TZAREWNA; Imperial Yacht STANDARD; Cruiser ROSSYA; School Ship VERNY; Cruiser SVETLANA; Cruiser DIANA; Cruiser PULLADA; Torpedo Transport Boat BAKAN; KHERSON and MOSKBA, Ships of the Volunteer Fleet; Gunboat GILACH; Iron Clad EKATERINA II; Gunboat KOUBANETZ; Cruiser AURORA; Iron Clad EMPEREUR NICOLAS I; Iron Clad PRINCE POTIEMKINE DE TAURIDE; Cruiser BAYAN; Iron Clad CESAREWITCH; Gunboats TERETZ and OURALETZ; Iron Clad BORODINOW; SMOLENSK, Ship of the Russian volunteer fleet; cruiser BOJARINE.

## ENGLISH NAVY.

Torpedo Boat Destroyer SHARPSHOOTER; POWERFUL and TERRIBLE, iron clad cruisers; GLADIATOR, ARROGANT, FURIOUS, VINDICTIVE, cruisers; NIOBE, DIADEM, ANDROMEDA, EUROPA, cruisers; CANOPUS, GLORY, GOLIATH, ALBION, OCEAN, iron clad ships; ARGONAUT, ARIADNE, AMPHITRITE, SPARTIATE, HERMES, HIGHFLYER and HYACINTH, cruisers; VENGEANCE, iron clad; ALBERT AND VICTORIA, royal yacht; CONDOR

and ROSARIO, sloops; CRESSY, ABOUKIR, SUTLEY and HOGUE, cruisers; IMPLACABLE, FORMIDABLE and IRRESISTIBLE, VENERABLE, LONDON, BULWARK, iron clad ships; EURYALUS, BACHANTE, cruisers; MUTINE, RINALDO, SHEARWATER, sloops; CORNWALLIS, DUNCAN, EXMOUTH, RUSSEL, iron clad ships; DRAKE, KING ALFRED, LEVIATHAN, AFRICA, cruisers; VESTAL, sloop; MONMOUTH, cruiser; BEDFORD, cruiser; ESSEX, KENT, cruisers; ALBEMARLE, MONTAGUE, battleships.

The total horse power of boilers fitted on board the 57 above named ships of the British navy is nearly 900,000.

## AUSTRIAN NAVY.

BUDA-PEST, iron clad coast guard; KAISER KARL VI, cruiser; X', X'', battleships.

## ITALIAN NAVY.

VARESE, cruiser; BENEDETTO BRIN, battleship.

## ARGENTINE REPUBLIC.

PUEYREDON, cruiser; Steamships PUERTO-HUERGO and MENDOZA.

## SPANISH NAVY.

REINA REGENTE, cruiser.

## CHILIAN NAVY.

O'HIGGINS, cruiser; ALMIRATE LYNCH, torpedo boat destroyer; ALMIRANTE CONDELL, torpedo boat destroyer; GENERAL BAQUEDANO, school ship.

## JAPANESE NAVY.

SHIKISHIMA, iron clad; CHIYODA, cruiser; ASAHI, iron clad; IWATE, cruiser; AZUMA, cruiser; HATSUSE, iron clad; ITSUKUSHIMA, iron clad coast guard; MIKASA, battleship.

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Representative Alexander of Buffalo has been disappointed in his hope to have the bill for a light and fog signal station at Buffalo called up in the house and passed immediately. He hopes to secure unanimous consent for the consideration of the bill later. The measure appropriates \$45,000 for a light-house on one side of the Stony Point entrance to the breakwater enclosure and for a fog signal station on the other side of the entrance. The project has the indorsement of the light-house board.

The Nickel Plate road has become a member of the Central Passenger Association mileage ticket bureau, and all mileage tickets properly issued by any line a member of that bureau are valid for use on that road in the same manner as on other roads that are members of that bureau.

30 Mar. 16.

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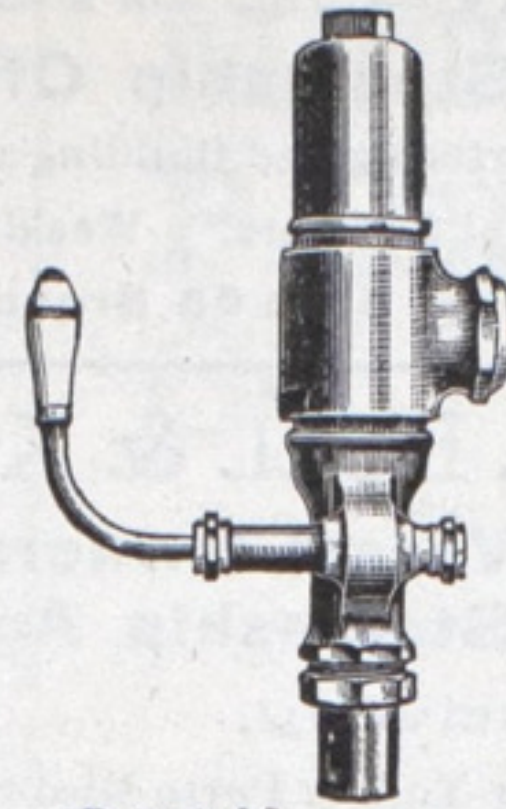
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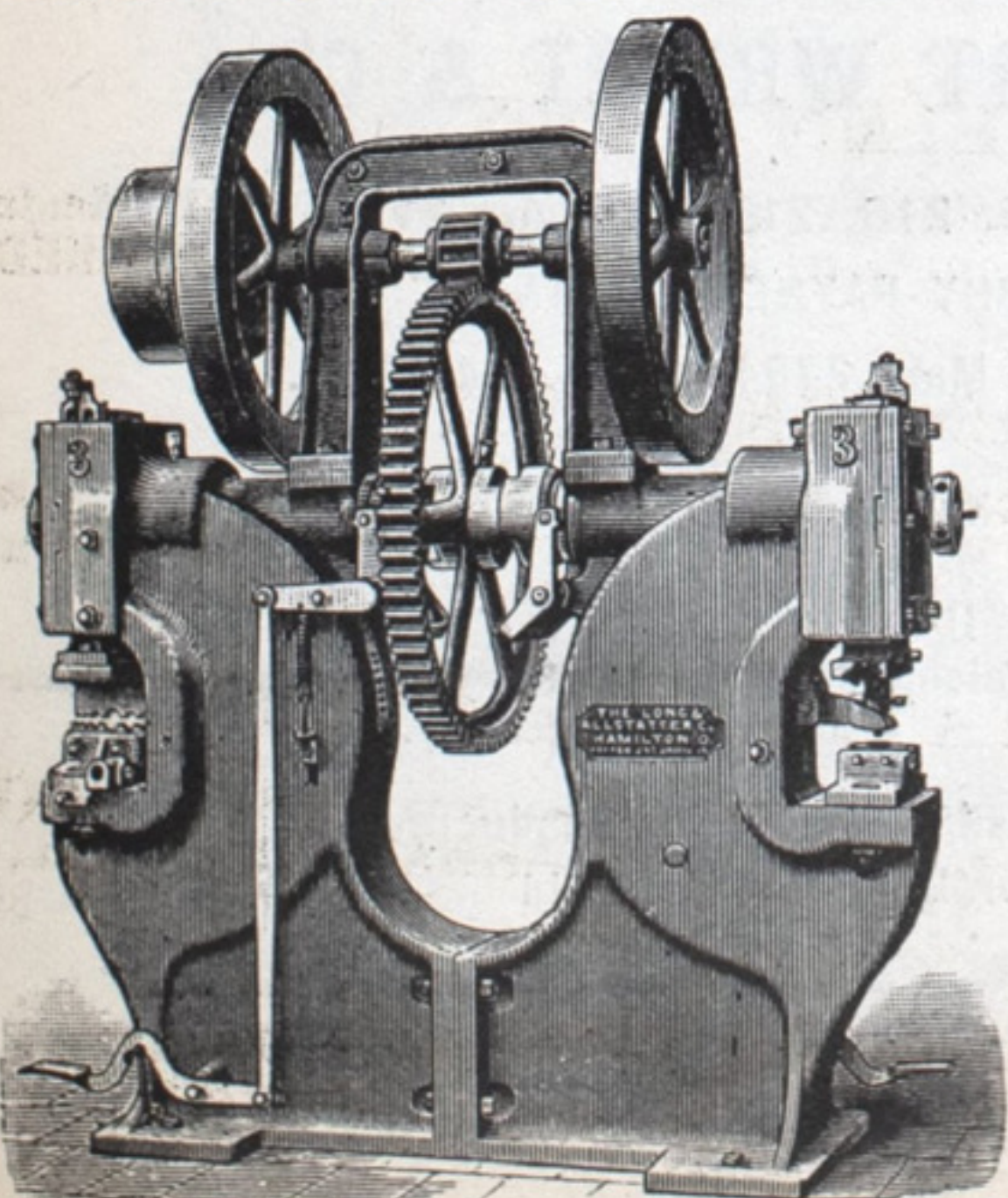
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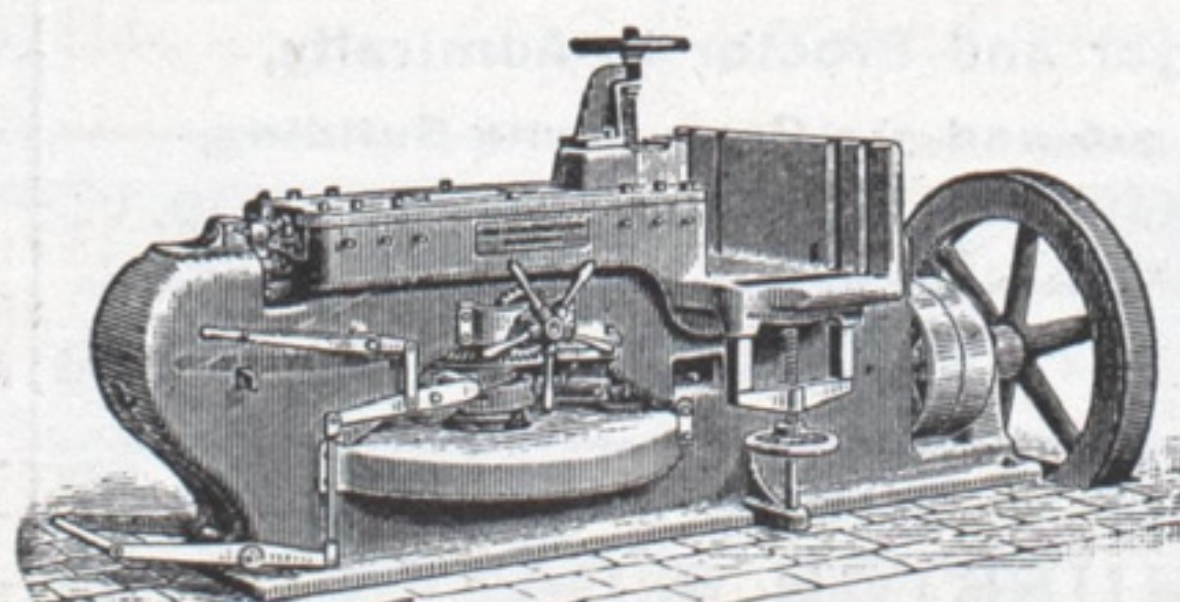
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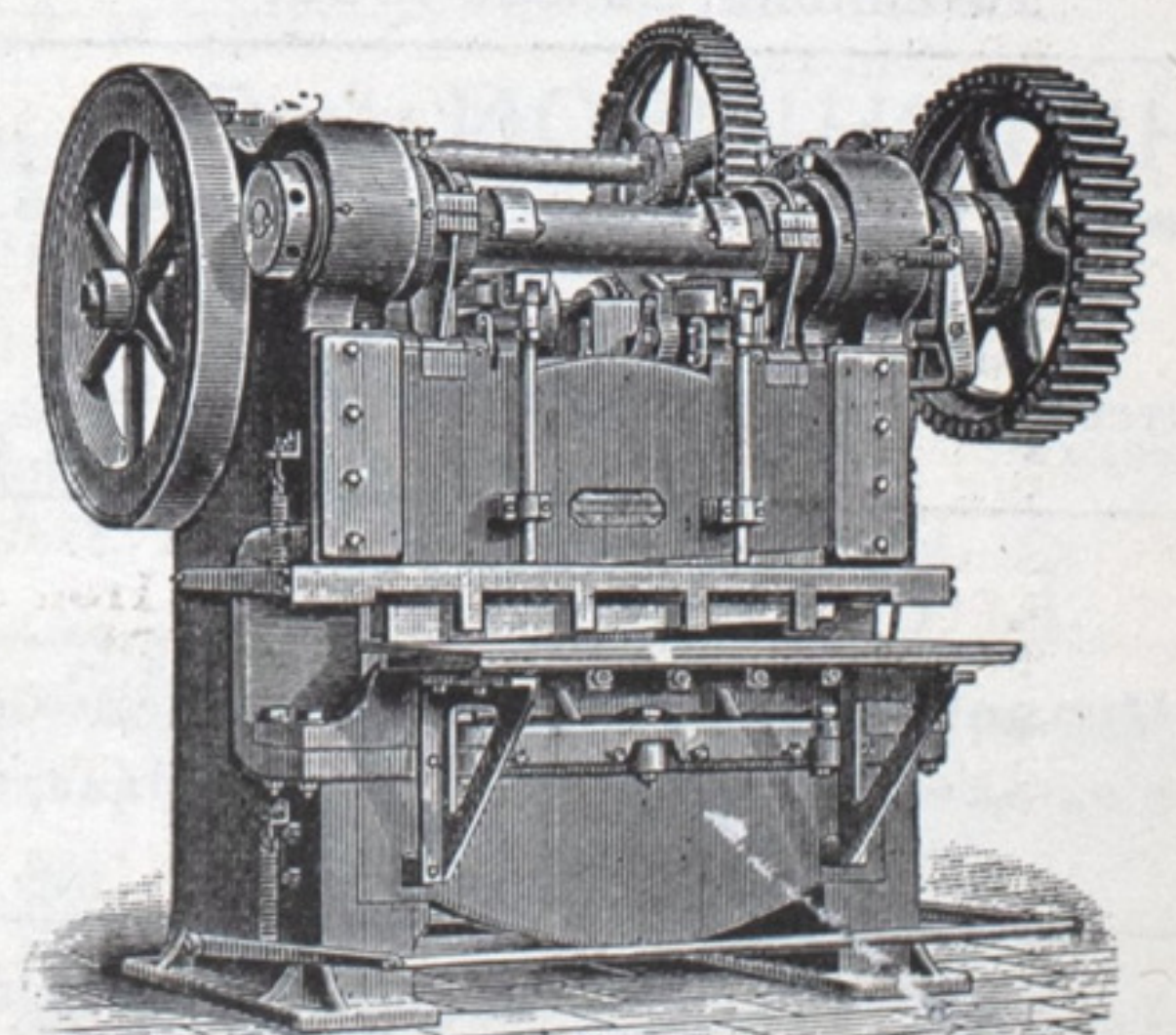


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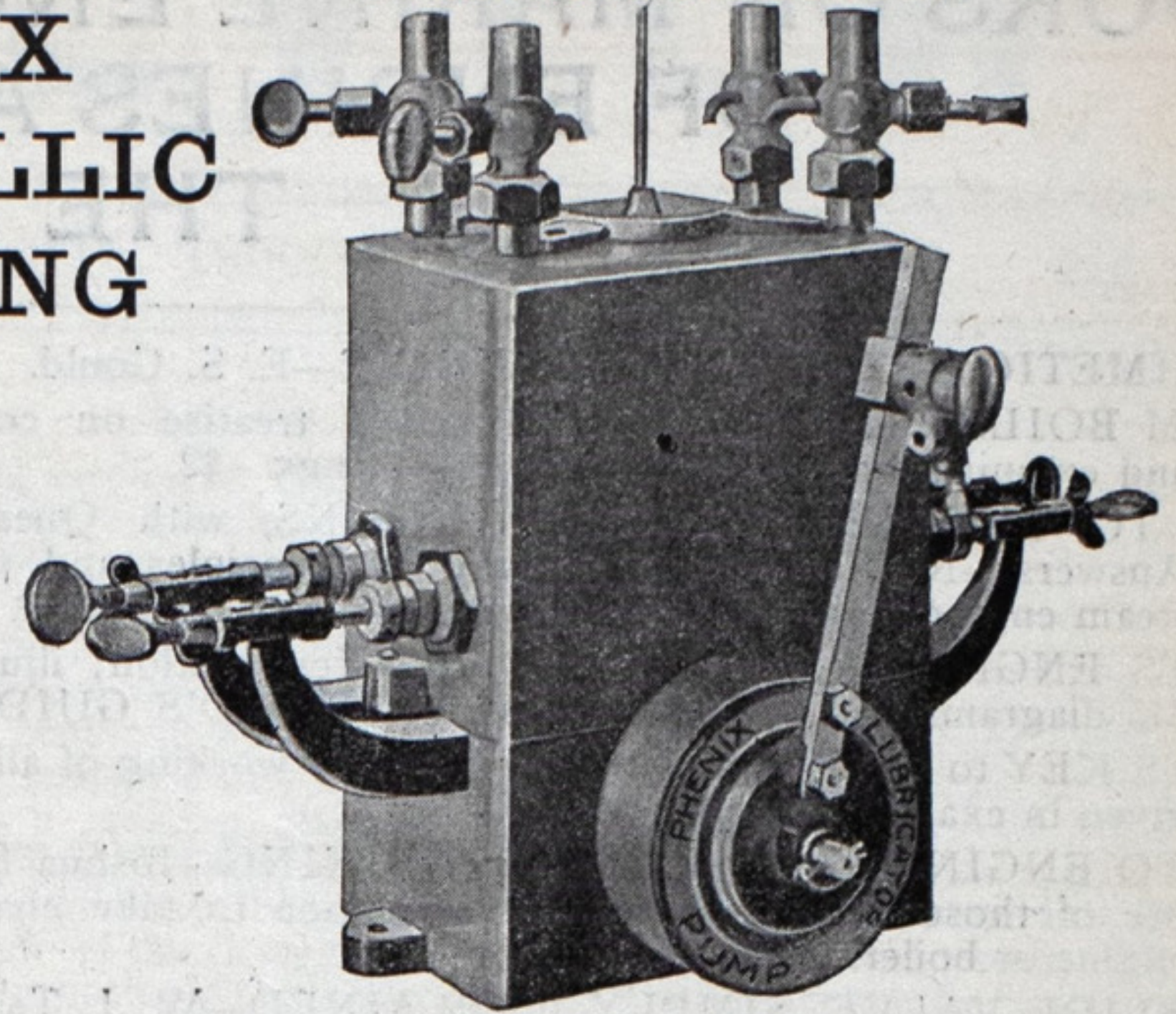
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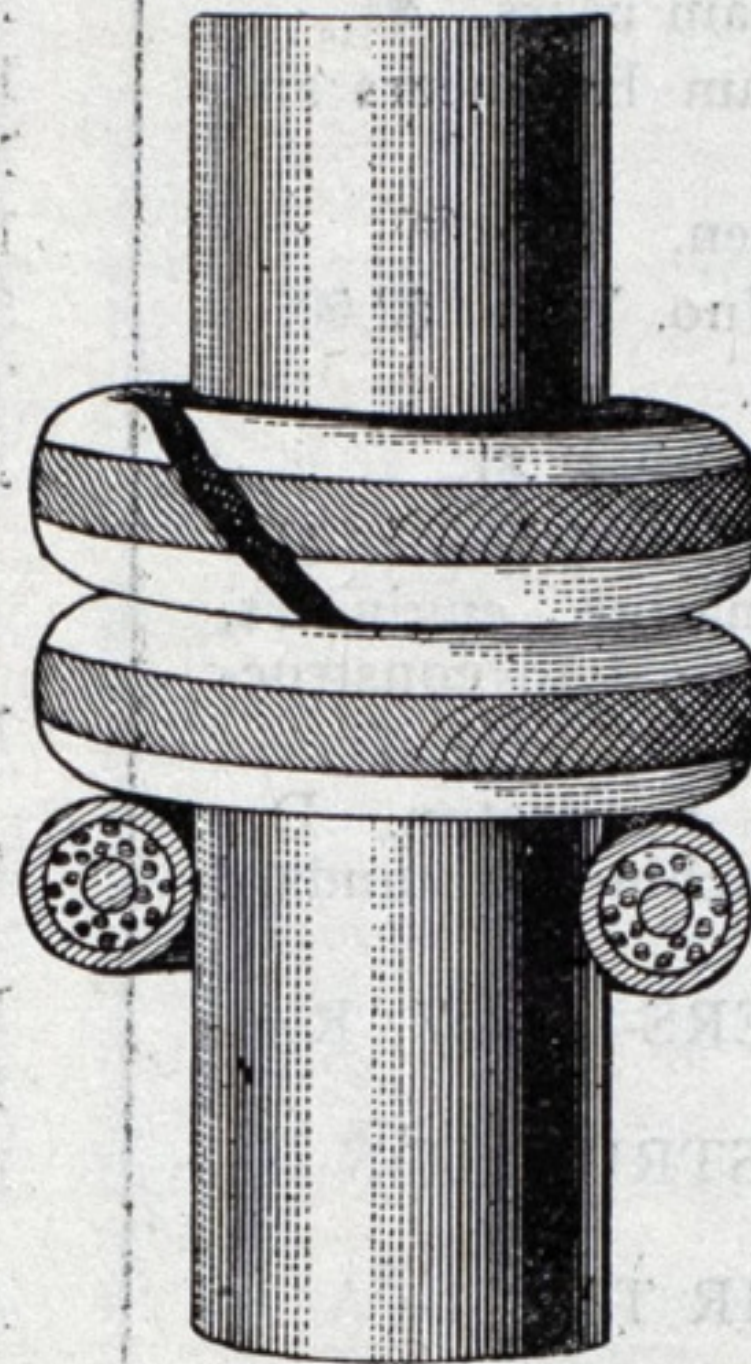
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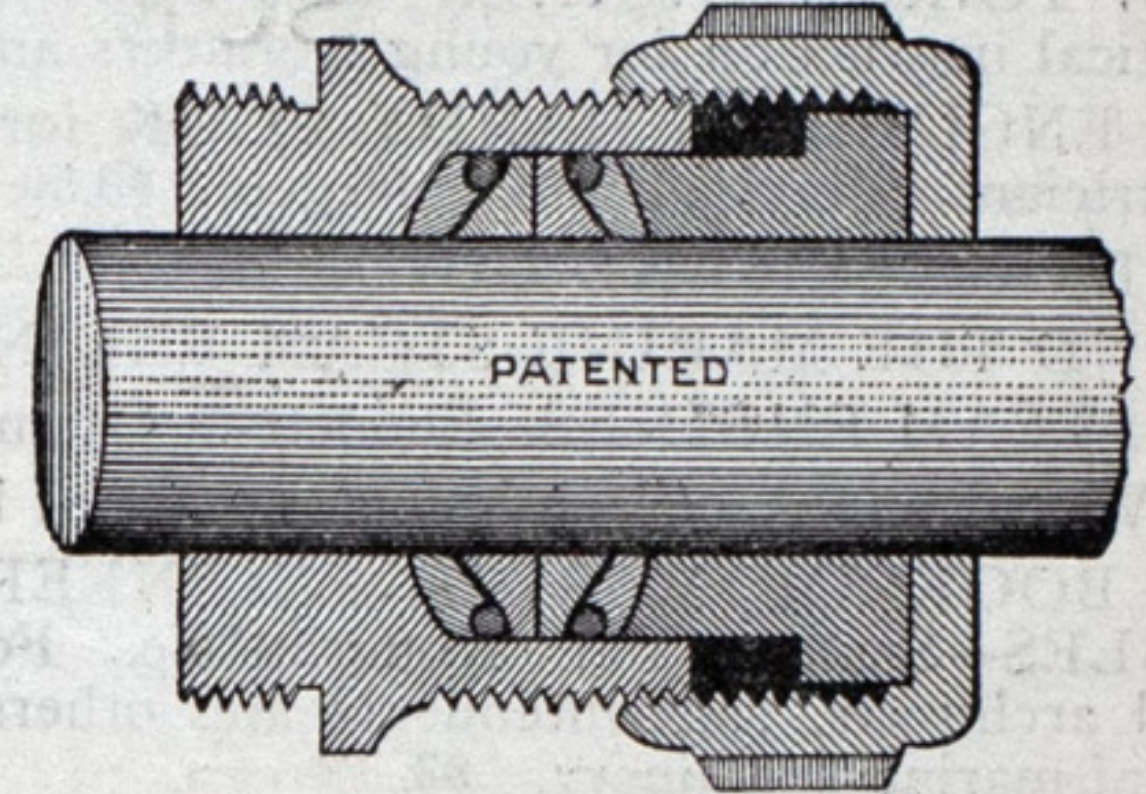
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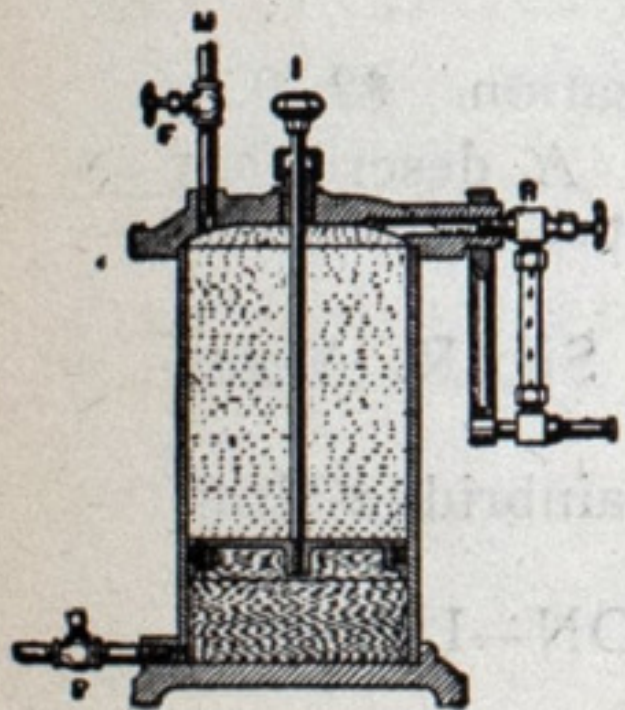
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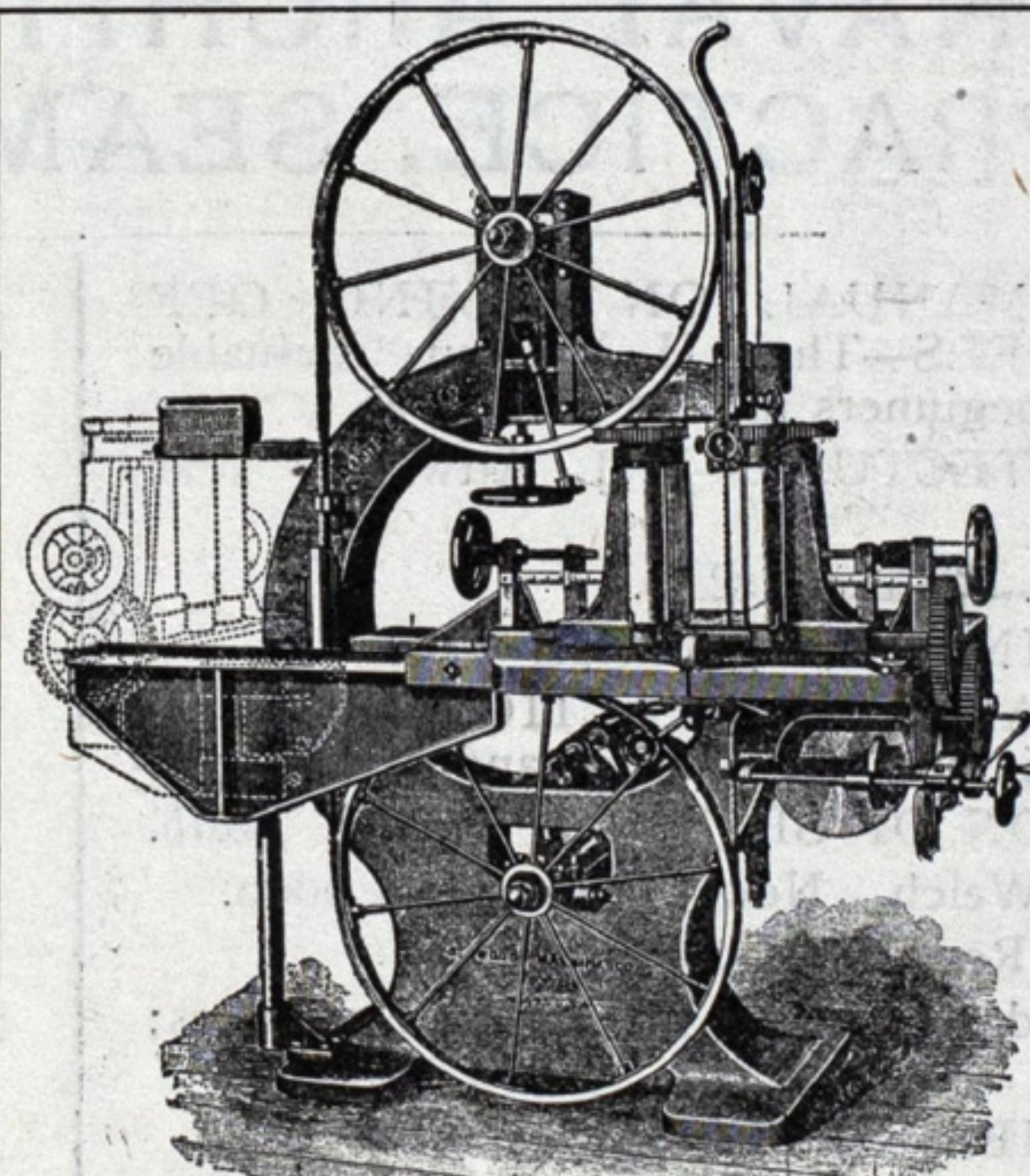
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